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Gas Journal

Vol 267. 103rd Year. LONDON, AUGUST 22, 1951. No. 4603. Price 1/-
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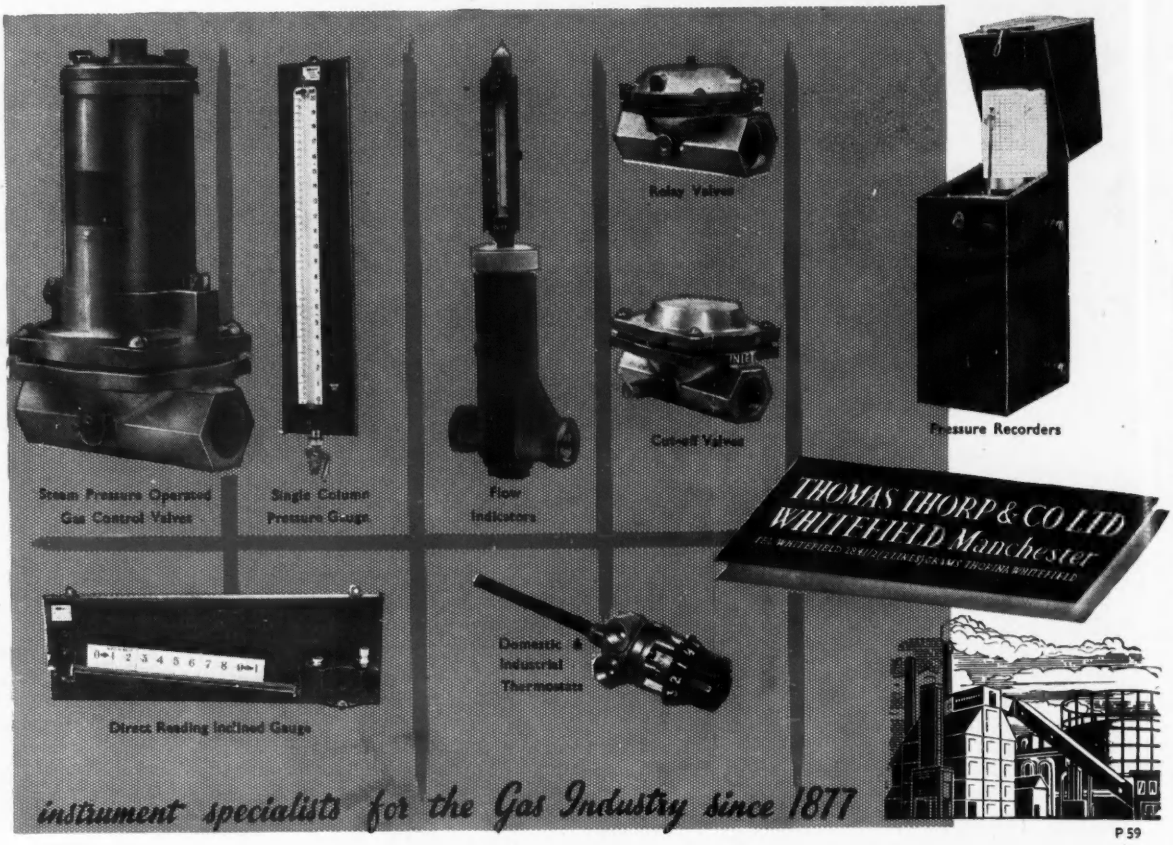
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P 59

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These Governors reduce the pressure of the Gas (up t 50 lbs. per square inch) at the inlet down to the ordinar district pressure.

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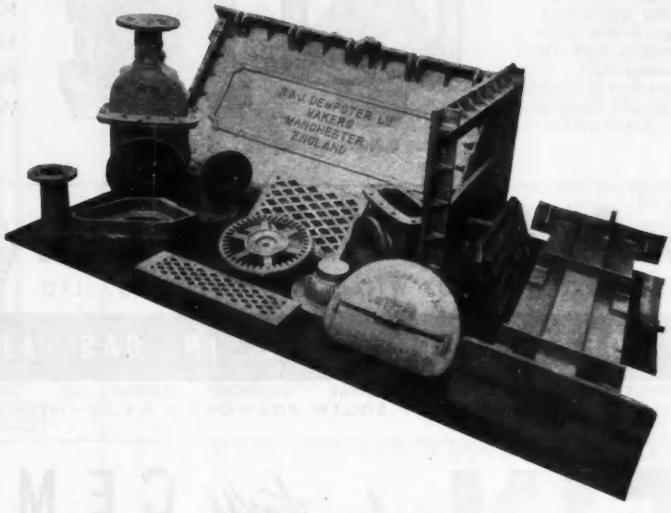

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The jet is adjusted by a milled cap to give any desired consumption within the specified range, and is locked in position by a locking ring. Control of the air is effected by a split milled ring on the body of the Injector.

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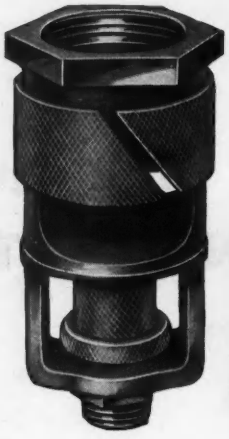
Minimum restriction to the gas flow is achieved with this new and novel design, and in this case the gas connection is at right angles to the outlet.



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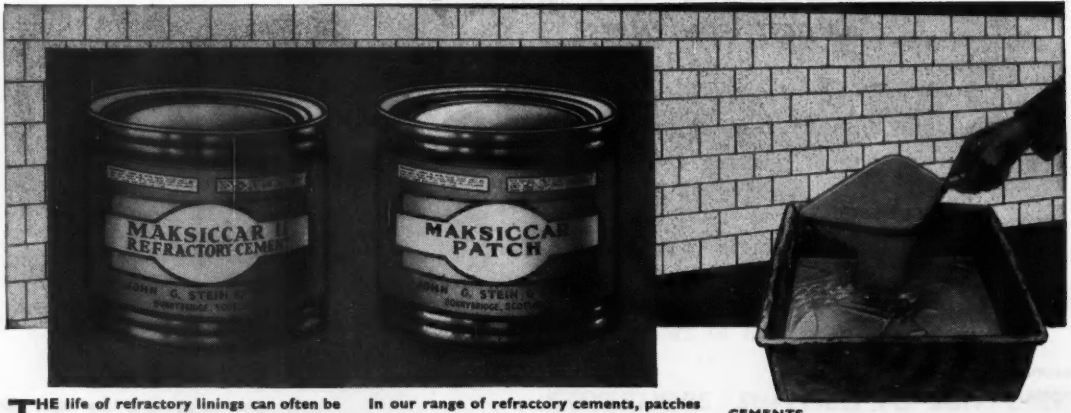

THE life of refractory linings can often be improved by the right choice of jointing cement. The best cement to use will depend on the specific conditions in the furnace concerned. Similarly in the use of refractory patches to repair damaged brickwork, or to replace special shapes in certain conditions, much better results will be obtained from the material with properly balanced properties.

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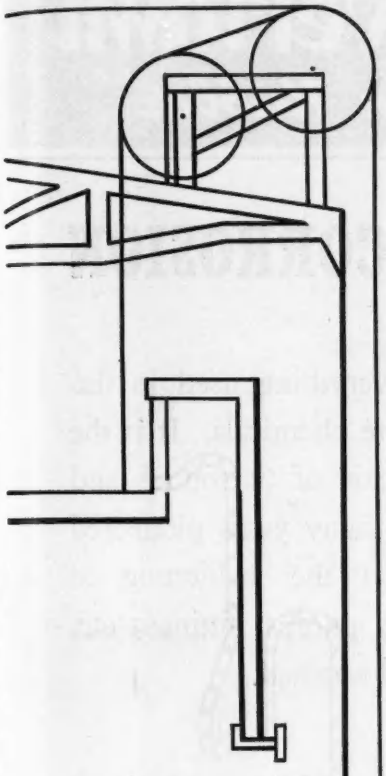

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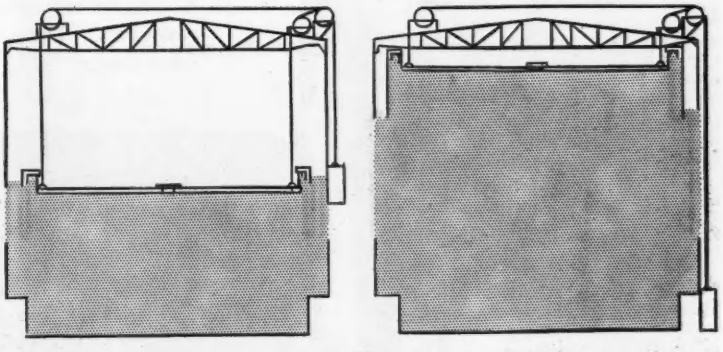
The Wiggins Gasholder is designed for the storage of water gas, blue or carburetted, hydrogen, carbon dioxide, carbon monoxide, oxygen, nitrogen, coke oven gas and other industrial gases.



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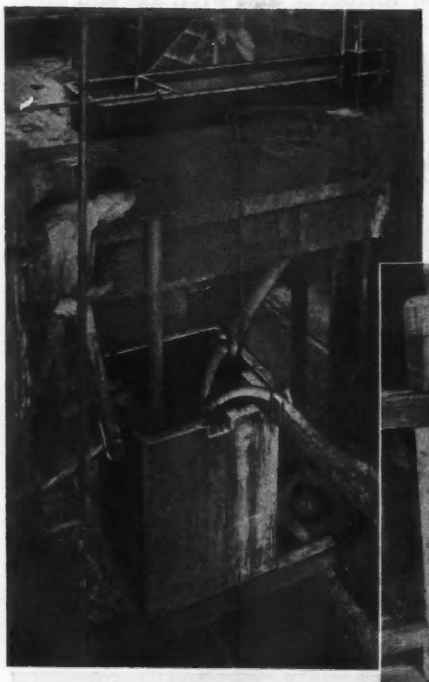
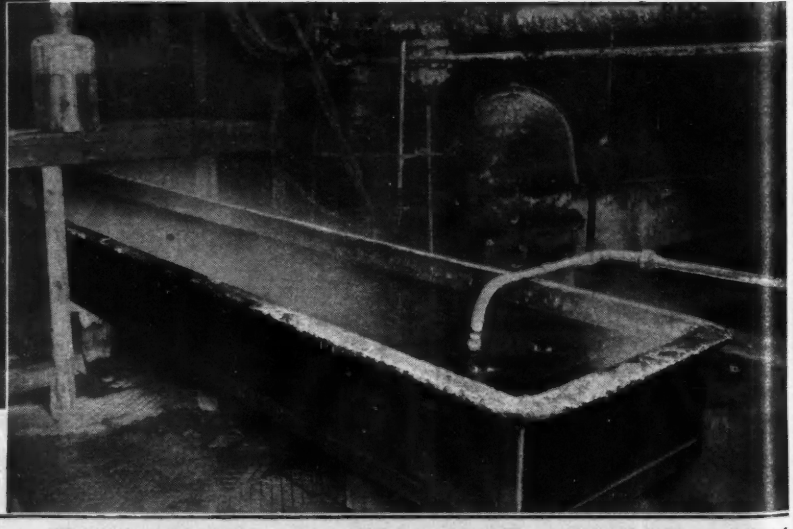


Silvertown rubber and ebonite tank linings at Partington Gas Works, Urmston, Manchester.

(1) Re-heating tank for $(N.H.4)_2$ Ammon. Sulphate;

(2) Acid liquor circulating pot. Normal temperature: Inlet 54°C., outlet 72°C. Temperature varies with flow of liquor and at times reaches 100°C.



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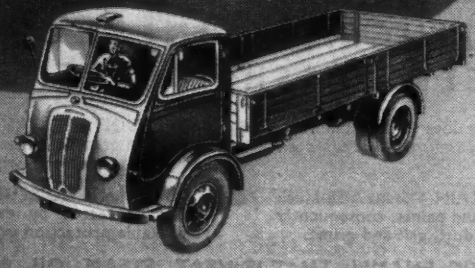

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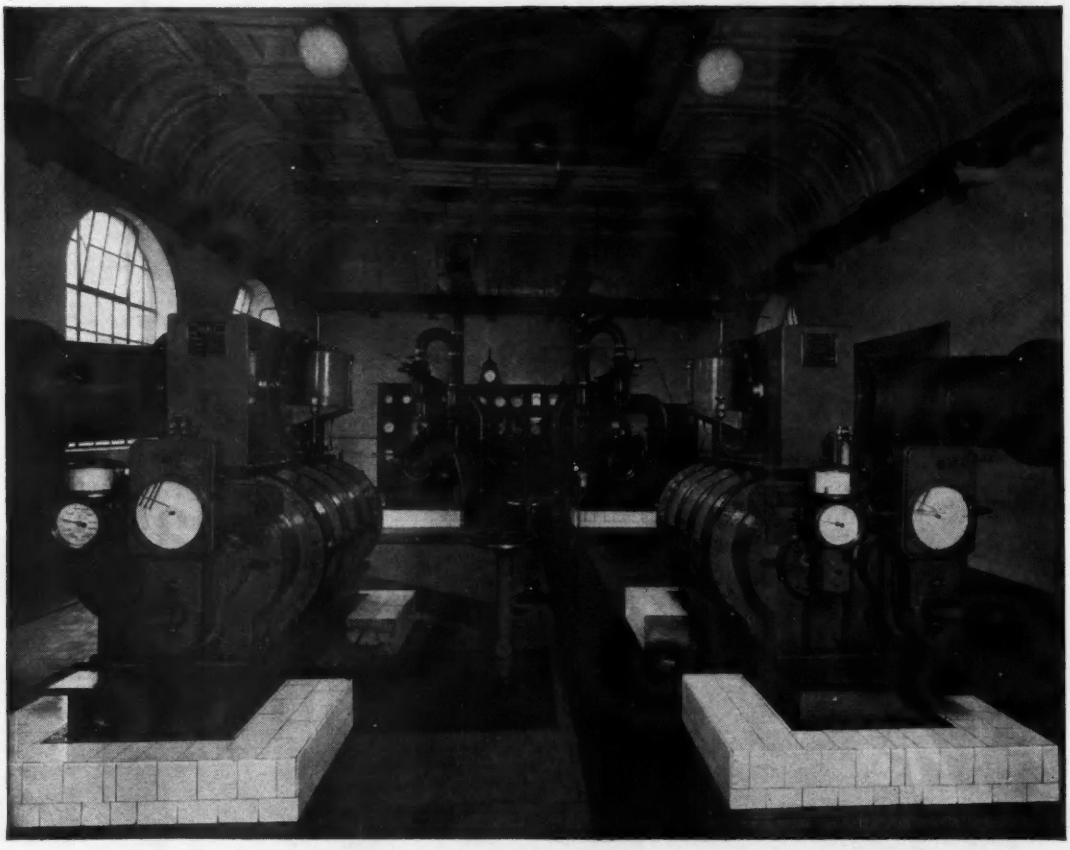

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for **WALLS, CEILINGS, ENGINES, COMPRESSORS, CANTEENS, WASH-HOUSES, ETC.**

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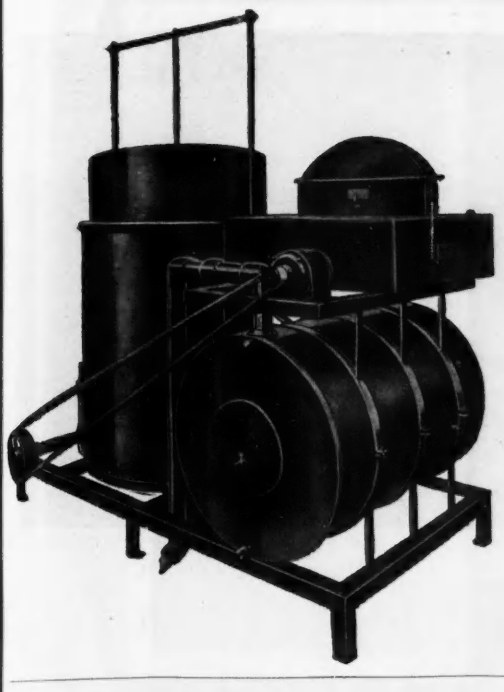

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THESE Steel Pipes

COURTESY STEWARTS AND LLOYDS LTD.

will NOT corrode

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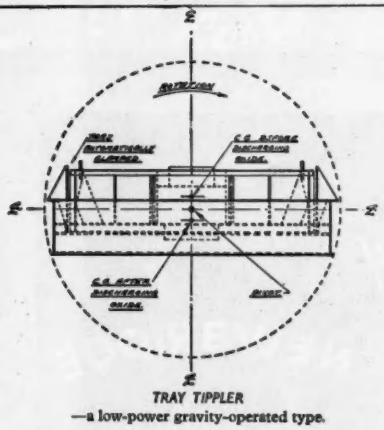
An impression of the new Balfour-Lecocq Tower Box Purifier—the first of its kind—now being constructed for an East Midlands undertaking.



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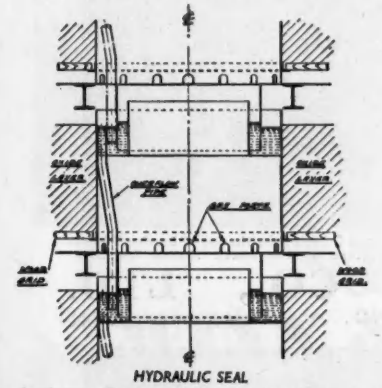
—a low-power gravity-operated type.



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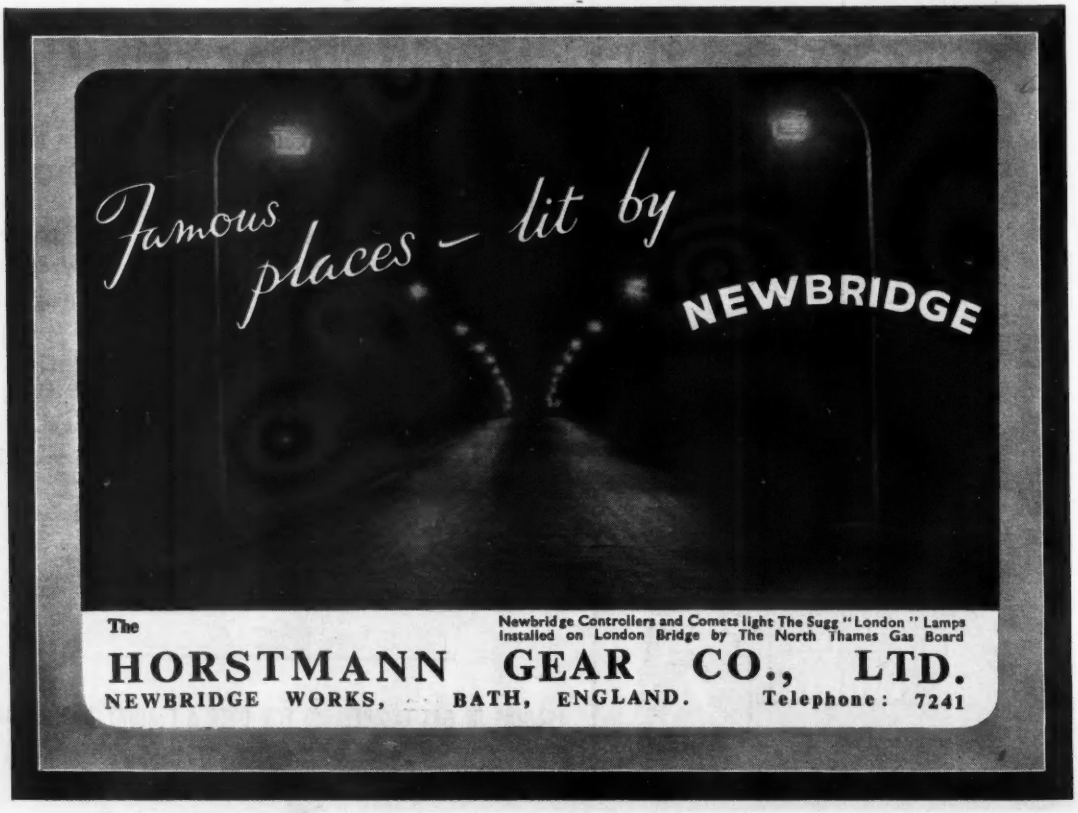
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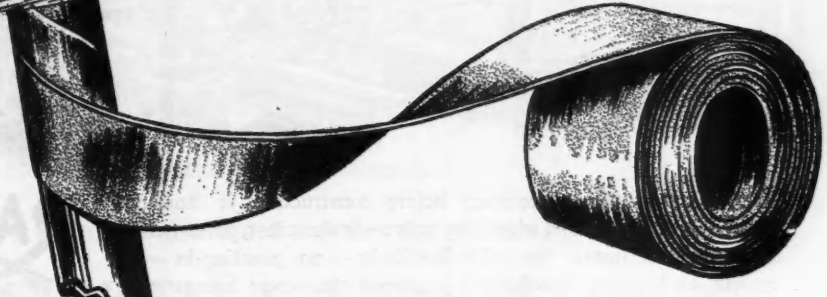

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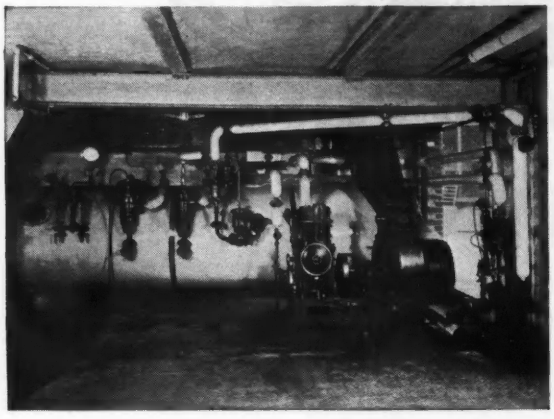

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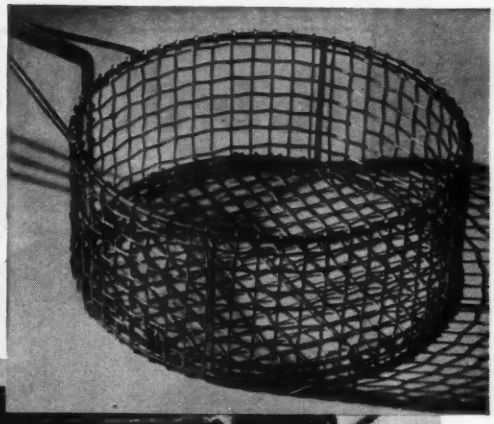

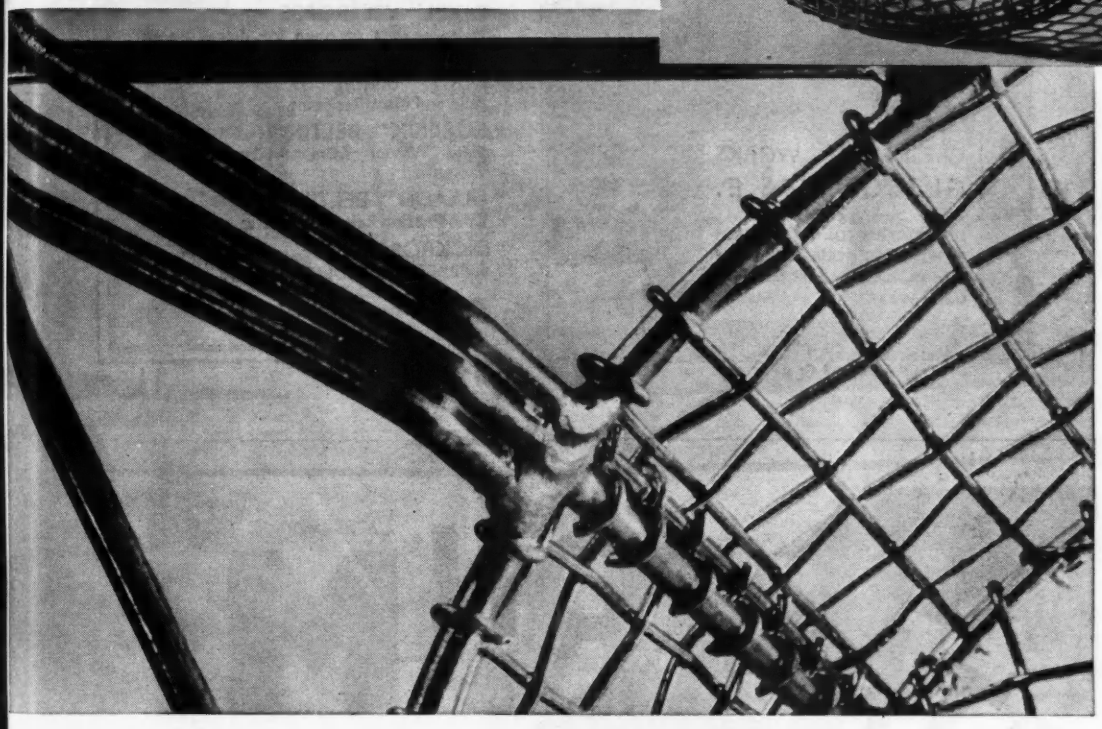

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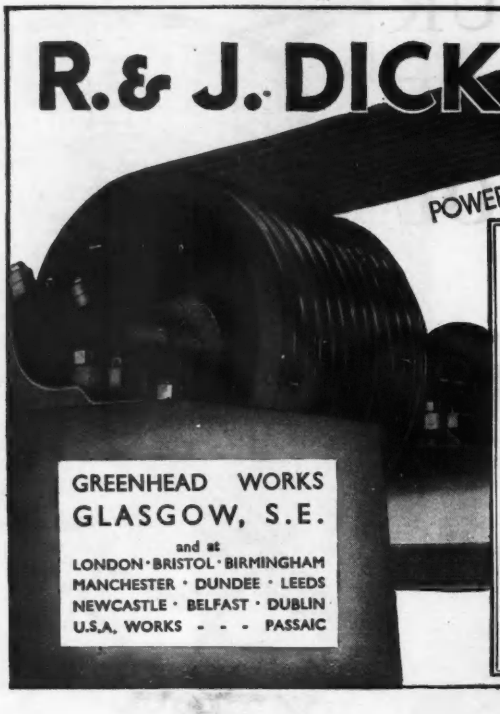

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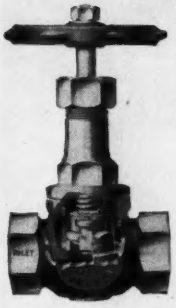

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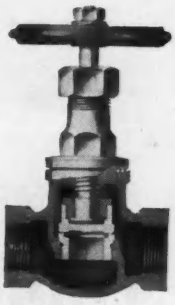

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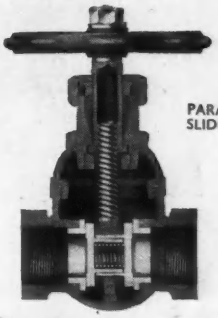

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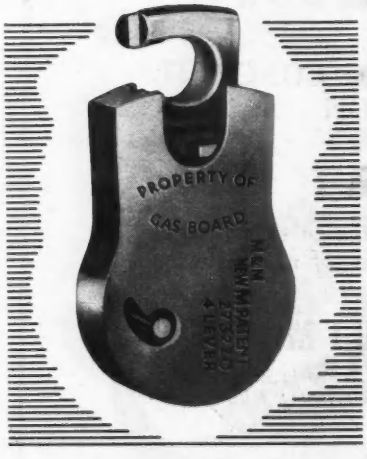

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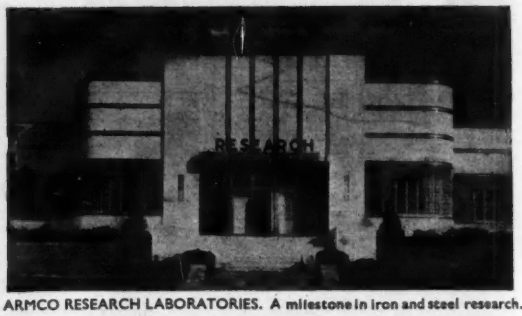

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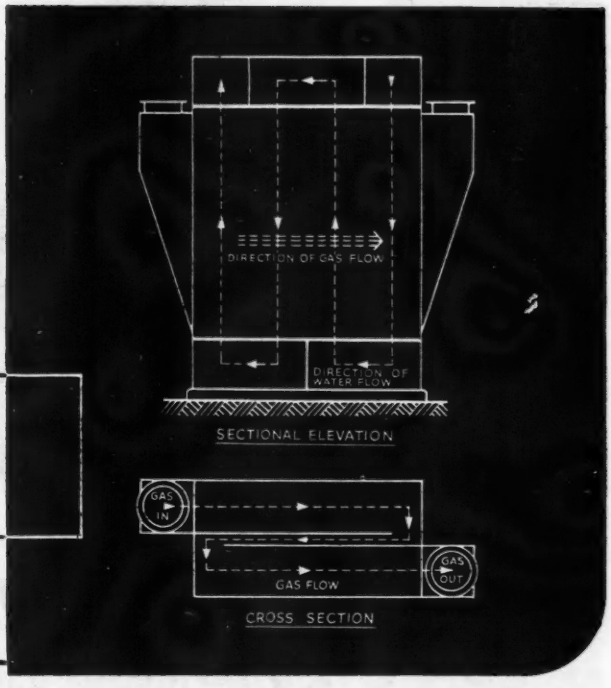

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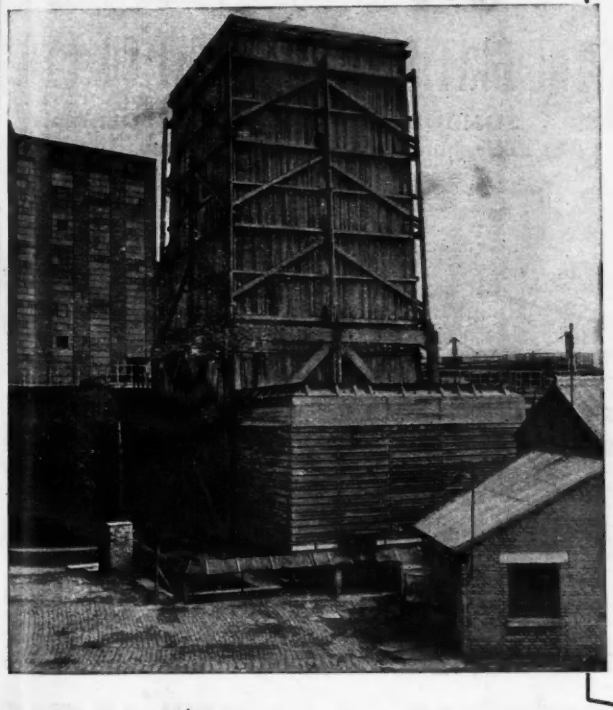

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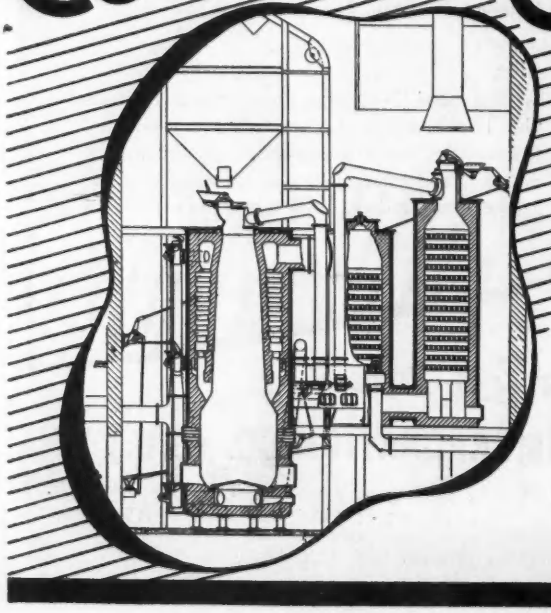

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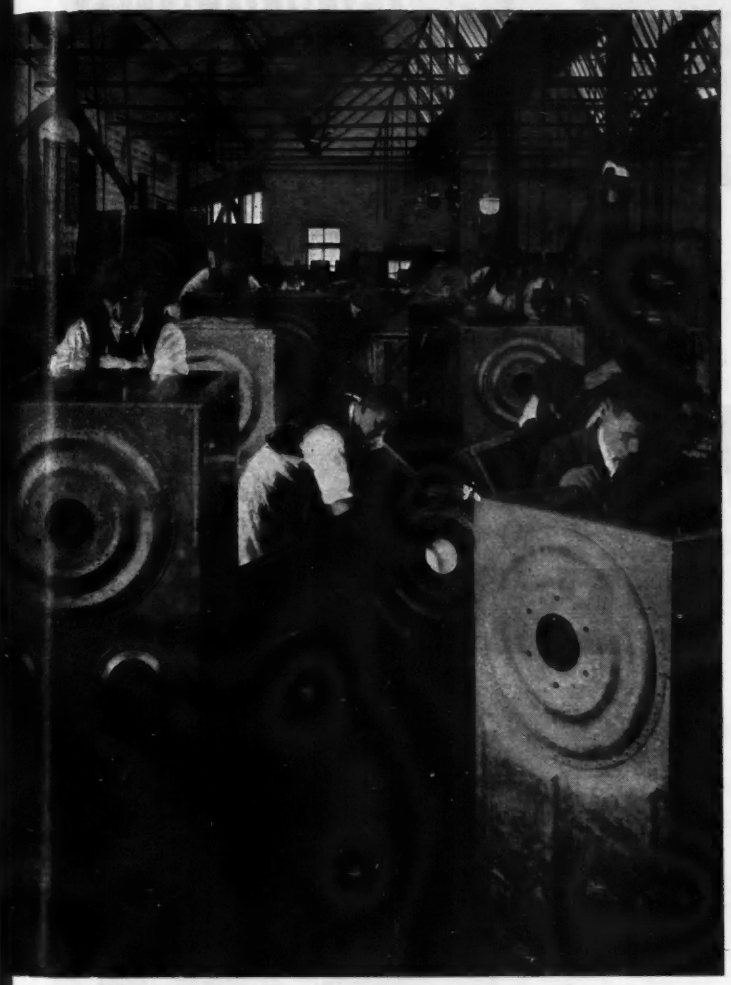

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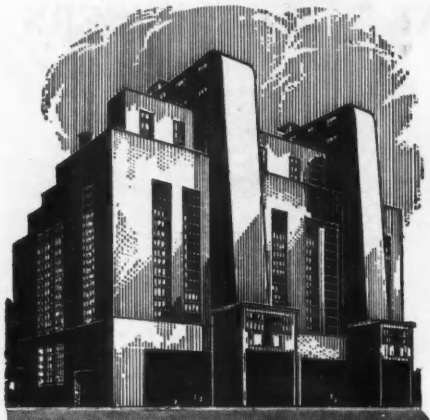

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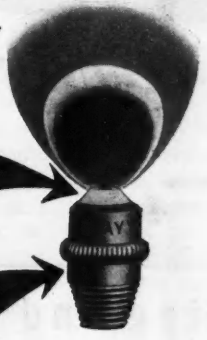

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103rd YEAR OF PUBLICATION

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11, BOLT COURT, FLEET ST., LONDON, E.C.4. Telephone: CENtral 2236-7. Telegrams: Gasking, Fleet.

VOL. 267 NO. 4603 AUGUST 22, 1951

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Subscription Rates : Home and Empire 52/-; Foreign 60/-

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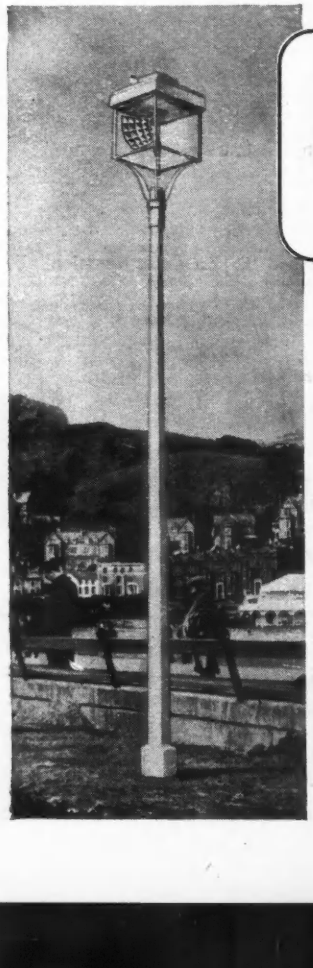

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GAS JOURNAL

VOL. 267. NO. 4603 103RD YEAR AUGUST 22, 1951

COKE PLIGHT

WE commented in the *Journal* last week on the very serious coke position throughout the country, which has led to the imposition by the Minister of Fuel and Power of a Statutory Order restricting supplies for the greater part of nine months to all but priority users. Though shortage is apparent almost everywhere, it is probably true to say that it is most acute in the highly industrialised areas of the Midlands and North West. We may therefore turn from the general to the particular and consider the steps being taken to meet the emergency in one of these areas. The North Western Gas Board was quick to realise that the coke available for sale after industry and other essential services have been supplied will be insufficient to give householders more than a fraction of the 30 cwt. fixed by the new Order as a maximum.

With the co-operation of merchants, who have agreed to follow the same procedure, the Board has announced that until October 31, when the position will again be reviewed, the following measures will be adopted. Essential services will receive their full requirements. Other regular non-domestic users such as small industries, churches, clubs, offices, hotels, cinemas, etc., will be supplied with not more than the 'statutory' 30 cwt. over the full period stipulated in the Order (subject, of course, to permits for larger quantities granted by the local Fuel Overseer). Thereafter, regular domestic consumers will not receive more than 2 cwt. between now and the end of October. There is, however, some dispensation for those who have no other means of cooking or water heating; these may get up to 10 cwt. in this period. New applicants will not be supplied until the quantities fixed for regular customers have been delivered. Even the long-standing practice of collecting small lots from the gasworks has had to be revised. Indeed, the Gas Board has gone beyond the terms of the Order (which permits the collection of half-hundredweights *ad. lib.*) and has restricted the amount to 28 lb. per fortnight, which will be supplied only against permit—and even the permit may be withheld from regular customers who have their coke delivered normally to them.

Thus we find in the North West a rationing scheme within the framework of the Statutory Order. Harsh as it is, the Gas Board will claim—probably quite legitimately—that it is no more than justice, though rough justice, to meet exceptional circumstances. The immediate fault lies rather in the framing of the Order which, while not a rationing scheme in the strict meaning of the term still looks like one to the uninitiated. Like dividend limitation, there is a ceiling but no floor. There will inevitably be much misunderstanding and ill will as a result of people thinking they are entitled to not less than 30 cwt. in the nine months, and it is important that our publicity and public relations officers do all in their power to make the position clear.

The situation in the Midlands is little, if any, less serious. Following a check at gasworks in the West Midlands area towards the end of July it was found that coal stocks were no more than 3.2 winter weeks' consumption. A request to the N.C.B. in June for an extra 3,500 tons a week was turned down. The coke position is similarly critical. Industrial consumption went up during the first summer quarter from 44,140 tons to 48,524 tons; non-industrial from 25,543 to 33,923 tons; and domestic from 18,507 to 24,294 tons in comparison with last year. The increase in domestic and non-industrial consumption alone is over 31%. These facts are revealed in a memorandum sent by the West Midlands Gas Board to Members of Parliament for constituencies within the area. What is the answer to this problem? The short answer is more coal and still more coal, coupled with a far-sighted national fuel

policy. Statutory Orders of the kind now inflicted upon us merely stab at the fringe of the problem. They are, in effect, little more than an effort to shut the stable door after the horse has bolted. The long-term answer lies in the resolute tackling of the national economy as a whole—the will to work longer and harder *for the same pay;* more thought for our duties and less for our rights. That is the answer, in a few words, not only to this particular fuel problem but to the whole range of industrial problems which confront us today.

BE SURE OF YOUR ECONOMICS

THE annual conference of the Incorporated Plant Engineers at Buxton was graced by one of those witty addresses in which Mr. Oliver Lyle is accustomed to clothe his wisdom in fuel technology. He gave it the title, 'Calling the Tune'—He who pays the piper can call the tune—but we are not sure whether one of his sub-titles would not have been more appropriate—'Be sure of your economics'. As an elementary example, he instanced the installation of mechanism at a cost of £5,000 to save three men. The annual saving is not just three men at £6 a week for 52 weeks, for what does a man at £6 per week really cost per year? If the plant is to be kept going the fortnight's holiday must be covered by relief labour, so that 54 weeks pay must be found. National and other insurance, wage, office, and miscellaneous costs may amount to 14% on the wage bill. The real saving may be as much as £1,108. On the other hand depreciation of the mechanism must be allowed for at 10½. Maintenance and renewals and power costs may amount to £140 a year. So that the net saving may be no more than £468. If that were the end of the story the return on capital outlay would be very poor. But if to this direct saving can be added an improvement in the quality of the product—if wasters can be reduced by one or two per cent—the gross saving may be such as to return the yield on the capital outlay to 20% or even more. And that goes for the installation of modern combustion and heating appliances as well.

But it was when Mr. Lyle turned to what he called the marginal cost of steam and power and to the economics of coupling small private power installations up with the grid that we got really interested. Dealing with the costs of steam production, Mr. Lyle divided them into 'fixed costs'—capital charges, wages, etc.—which are independent of output, and 'marginal costs'—coal, coal-handling, ash-handling, water, water-treatment, etc.—which are dependent on (and roughly proportional to) output. Reduction in steam consumption saves marginal costs only, not the total cost of steam production.

Conversely the marginal cost of back pressure power is the coal cost of the electrical heat equivalent divided by the boiler efficiency. This is the figure, or something like it, in which the gas industry is interested in the schemes which have been proposed for interchange of power supply with the grid. In general terms there are many industrial plants which could help to relieve the nation of the crippling effect of power cuts by putting into the national network a significant amount of very economically produced current. 'If the British Electricity Authority would allow factories to run in parallel with the grid; if, in fact, they went further and encouraged all possible installations to join together in the common weal, a sizable load could be lifted from the power stations.' The difficulty which must be recognised is that this current is not always available when it is most needed. It is not surprising that 'we usually have to pay 1¼d. or 1½d. a unit for our current when we buy it; but when we try to sell it to the grid all we are offered is about a farthing.' We cannot expect the Authority to pay more than the marginal cost of current at the power station. This is almost wholly the net cost of coal, and Mr. Lyle shows that at 50s. per ton of coal at 11,00 B.Th.U. per lb. and 10,000 B.Th.U. per unit, this works out at just the farthing. Now, the real marginal cost of back pressure power, with boiler efficiency 70% and gross coal cost—*i.e.*, inclusive of coal and ash handling—at 80s. per ton, is no more than 0.19d. So that a selling price of a farthing a unit not only offers 'a modest little profit, but you help to keep up the voltage, maintain the frequency, and minimise cuts.'

SURPLUS POWER FROM GASWORKS

THE big gasworks of the future will present a special case of surplus power available for use in the national electricity supply system. Mr. G. M. Rimmer, in his paper to the Institution in 1947, visualised both import from and export to the grid, but Dr. Burns shows that in the future it may be a question of export only. Works requirements of power and process steam can be fully met by boilers at ordinary pressures fired by waste heat and low grade fuel. 'If high pressure waste-heat boilers were employed (operating at 300 lb. per sq.in. and 600°F.) the amount of power generated could be raised to more than 30 kWh per ton of coal carbonised,' that is, 'more than the full internal requirements of the works after complete electrification.' The marginal cost of any such surplus power would presumably be the additional capital charges only. At a still further increase in capital charges the gas turbine promises to produce between 50 and 70 kWh per ton of coal corbonised. It is likely that the capital charges will amount to no more than 0.23d. per unit. It is clear that the gas industry will have current available to augment the national supply, without additional coal consumption, and at a cost well within the marginal cost of current at the power station. Naturally this current will be at its peak at the wrong time but so long as its variations are reasonably constant it should be possible to make accommodation for it. It will have to be treated as a negative load with its own daily characteristics.

A question which arises at this point is whether something cannot be done to level up internal power demand, or perhaps whether some of the practices now in vogue for obvious reasons should be curtailed. Coal and coke handling are the two big power consumers which make the peak demand in the daytime. Plant has been deliberately put in to limit working of these

plants to the day shift and the five day week. This policy may have to be reversed, at least to some extent. The gas industry, then, will be in a position to offer current to the electricity industry. An equitable price should not be difficult to negotiate. The basis would be the marginal cost of current at the power station. But the gas industry may be in the position that it *must* dispose of surplus power. It would appear to be in the national interest that the B.E.A. should take it. If however 'such means of using surplus power were not acceptable there are other interesting possibilities.' Dr. Burns has described them—the production by one or other means of hydrogen and oxygen, both of which will be necessary in some of the new processes of gas manufacture which are awaiting development. The B.E.A. may be actually bidding for this power. The marginal cost of gas itself may be taken to be the net cost into holder. The time when gas could be sold in off-peak periods at this cost is probably at an end. It ceases to be profitable when plant otherwise idle is absorbed in production. Rather has the time arrived when prices of some supplies, notoriously those for public lighting, need reconsideration. And all future loads need careful scrutiny. These matters may well be on the agenda of the new committee now being set up by the Minister.

Mr. Lyle, in his humorous way, touched upon yet another aspect of the economy of labour saving devices. He describes the wonderful work he saw a-doing by 'an excavator, a very nice and modern muck-handling machine driven by a real artist' clearing up a bombed site in London. It was making a tremendous saving in labour. 'But the loss to the community is gigantic, because in some hundreds of offices all round there are always six people at each window watching the driver.' We need to be sure of our economics. Money is a good, practical, and convenient measure of wealth—but it is not wealth itself. It may be cheaper for instance, for the time being at any rate, to burn coal to generate current to make synthetic ammonia than to recover it from the carbonising process. But is it good economics? It may be cheaper at any given time to import sulphur, but in the long run would it not be sounder economics to recover it from native sources, particularly from native coal in the same process? Once again Mr. Lyle provided good entertainment savoured with much wisdom. Mr. Boon brought the discussion back from detail to the bed-rock of coal conservation. He said nothing new. These appeals for greater efficiency have become almost platitudes. He is one of the members already appointed to the new committee. We grow impatient for the results of their work.

BRIQUETTES FROM CINDERS

THREATENED as we are with a fuel crisis little less severe than that of 1947 the Ministry of Fuel and Power asks us to reclaim all burnable cinders when we clean out our domestic grates, and local authorities are reminded that the establishment of more municipal briquetting plants might provide a valuable supply of subsidiary fuel in the winter. Under the heading 'Fuel from the Dustbins' a *Manchester Guardian* report stated a few days ago that Leeds has been making briquettes from cinders recovered from dustbins since 1947. In the fuel crisis of that year the cleansing department found that people were eager to buy back cinders just as they were from the refuse depots, but the department decided to see if it could turn its cinders into rather more useful briquettes. It already possessed plant for separating cinders from dead ash, and a briquetting plant was installed at a cost of about £500. It was soon turning out about 20 tons a week, all from ashes thrown away in the city, and now has a capacity of about 50 tons a week. The briquettes are sold to the public at 3s. 3d. a bag, which is rather less than the cost of coke, and there is a brisk sale, even in the summer.

The Leeds plant, says the *Guardian*, costs little to run, and the city council has had a number of enquiries about it from other municipalities. Some authorities seem to feel that there is no need to go in for briquetting because they can sell their cinders untreated for various types of industrial boilers, such as those used by market gardeners for heating greenhouses. It is far from certain, however, that cinders are recovered for use again as fuel in all areas where they could be recovered. One advantage of making them into briquettes is that they are made available for a much wider range of use than by being sold as cinders.

STANDARDISING TARIFFS

MEMBERS of gas consultative councils who are almost unanimously urging their respective gas boards to press on with the standardisation of tariffs on an area, if not a national, basis will be interested to learn that in accordance with the Electricity (Supply) Act, 1947, which charges electricity boards with the duty of simplifying tariffs, the Southern Electricity Board is introducing a standard domestic tariff from October 1. Where the dwelling house contains four or less than four assessable rooms, supplies given through credit meters will be charged at 5d. per unit for the first 40 units in the same quarter, and 0.875d. per unit for each additional unit. With prepayment meters, the first 40 units will be charged at 6d., the excess remaining at 0.875d. Where the dwelling house contains more than four assessable rooms, the number of initial block units is derived by multiplying the number of rooms by 10 and the prices are 5d. per unit for the initial block and 0.875d. for each unit in excess. This is for credit meters. For prepayment meters, the number of units in the initial block is derived in the same manner but the first 40 only are charged at 6d. per unit, the remainder in the initial block at 5d., and all excess units are charged at 0.875d. per unit. These tariffs do not apply to temporary or seasonal supplies, where the price will form the subject of special quotations dependent on the individual circumstances. No meter rents will be charged for the hire of meters required to register the value of the supply, but a rent will be charged for any additional meter installed at the express wish of a consumer. For the purpose of the tariffs, all rooms are assessable, whether used or not and whether wired for electricity or not, with the following exceptions: entrance hall or vestibule (except where used as lounge or sitting room); larders, sculleries (if additional to kitchen or kitchenette); cloakrooms, closets, lavatories; bathrooms, attics without access by permanent staircase; store rooms; box rooms or cellars, if such rooms or cellars are without external windows; central heating chambers; wash-houses; coal stores or coal cellars; garages and greenhouses.

Letter to the Editor

GAS COOLING AND WASHING

DEAR SIR,—In reply to the letter from Mr. George E. H. Keillor which you published in the *Journal* of August 15 (p. 394), we have actually looked into the possibilities of using refrigeration methods for gas cooling, but have never thought of any situation where it may be used with any justification for the high cost involved.

The same remarks will apply to the use of methods of upgrading the low-grade heat in condenser cooling water, though it is now becoming common practice to use the hot gas before the condensers for preheating feed water to the boilers.

Regarding Mr. Keillor's third point, there are many attractions in using surface evaporation for gas cooling in the case of vertical retort gases. Unfortunately, such condensers if built cheaply take up considerable ground space, and are liable to be a nuisance owing to the clouds of water vapour leaving them. We believe they are still being installed by the North Thames Gas Board.

Yours faithfully,

For W. C. Holmes & Co., Ltd.,
J. E. CULLINGWORTH.

Huddersfield.
August 16, 1951.

Personal

Mr. Norman Smith, B.SC., ASSOC.M.INST.GAS E., Editor of the *Journal*, is on medical advice being relieved of office duties for a period of at least three months. **Mr. Clifford King** has taken over Mr. Smith's administrative work and will act as Managing Editor of the firm's publications.

◇ ◇ ◇

Mr. H. I. Matthey has been appointed a director of the Morgan Crucible Co., Ltd.

◇ ◇ ◇

Mr. H. Streets, Chief Technical Engineer, has been appointed to the position of Technical Director of Richard Sutcliffe, Ltd., Horbury, Wakefield.

◇ ◇ ◇

Mr. K. G. Vickers, Cost Accountant with the Scottish Co-operative Wholesale Society, Glasgow, has resigned to take a new appointment with the Southern Gas Board at Southampton. Since taking up duty in 1947 Mr. Vickers has done much to develop modern costing methods in the S.C.W.S. plants.

◇ ◇ ◇

Mr. J. A. J. Blanckensee and **Miss E. P. Wood** (Joint General Managers of the Raw Materials Division of George Cohen Sons and Co., Ltd.) have been elected to the Boards of Pollock Brown and Co., Ltd., Westbourne Park Coal and Iron Co., Ltd., and Southall and Hayes Coal and Iron Co., Ltd.

◇ ◇ ◇

Mr. A. W. Hendley, chief gas fitter at the Southern Gas Board's works at Wallingford (Berkshire), was given a gold watch by his colleagues recently on his retirement after 41 years with the undertaking. The presentation was made by Mr. E. C. Heal, manager of the branch. When Mr. Hendley first started work with what was then the Wallingford Borough gas undertaking, output was 10 mill. cu.ft. annually. Now the annual production is 90 mill. cu.ft.

Obituary

Brigadier Evan Maclean Jack, C.B., C.M.G., D.S.O., D.L., died suddenly at his home in Southampton on August 10. For many years he was associated with the Southampton Gaslight and Coke Company. He joined the board in 1932, became deputy chairman and, following the death of Sir Russell Bencraft, was appointed chairman in 1944. He retained that position until nationalisation came in May, 1949.

Educated at Crediton and Hastings Grammar Schools and at the Royal Military College, Woolwich, Brigadier Jack was commissioned in the Royal Engineers in 1893. During the South African War he served in Gibraltar and St. Helena, and later in the Ordnance Survey at York and Southampton. Before the 1914-18 war he performed important duties on two boundary commissions in Africa. He was Assistant Commissioner to the Anglo-Congolese Boundary Commission from 1907-9, and Chief British Commissioner of the Anglo-German-Belgian Boundary Commission in 1911-12. When war broke out in August, 1914, he was attached to the geographical section of the War Office and was immediately sent to France as officer-in-charge of the topographical section of the General Staff. He was responsible for all survey work in France, and also for the formation of field survey battalions.

He was a member of the Royal Southampton Yacht Club for many years. Painting was one of Brigadier Jack's life-long hobbies. Last April he held a one-man exhibition of water-colours and wood engravings.

Diary

Aug. 30-Sept. 13.—Engineering, Marine, and Welding Exhibition, Olympia. (Gas Council exhibit).

Sept. 4.—East Midlands Gas Consultative Council: Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept. 4.—South Eastern Gas Consultative Council: Goring Hotel, Victoria, 2.30 p.m.

Sept. 5.—Industrial Gas Development Committee: Southern Gas Board Offices, Portsmouth, 9.30 a.m.

Sept. 6.—North British Association of Gas Managers: Annual General Meeting, Ayr. (Golf and bowling functions, Sept. 5; Excursion, Sept. 7).

Sept. 7.—Manchester and District Section, I.G.E.: Visit to Newton Chambers & Co., Ltd., Thorncliffe.

Sept. 10.—West Midlands Gas Consultative Council: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

Sept. 11-13.—Irish Gas Association: Annual General Meeting, Dublin. Business meeting, Alliance and Dublin Consumers' Gas Company's lecture theatre, D'Olier Street, 10.15 a.m. Afternoon visit at Guinness' Brewery. Annual Dinner, Royal Hibernian Hotel, 7.30 p.m. Sept. 12.—Coach visit to Greystones, 10 a.m. Sept. 13.—Golf competition.

Sept. 17.—Eastern Gas Consultative Council: Connaught Rooms, Great Queen Street, 2 p.m.

Sept. 18-21.—Association of Public Lighting Engineers: Annual General Meeting and Conference, Brighton.

Sept. 19.—South Western Gas Consultative Council: 34, Bridge Street, Taunton, 11 a.m.

Sept. 19.—Wales and Monmouthshire Section, Institution of Gas Engineers: Autumn Meeting, Llanelly.

Sept. 20.—Gas Council Commercial Managers' Committee: Edinburgh, 10 a.m.

Sept. 21.—Institution of Gas Engineers (North of England Section): 'Some Aspects of Gas Manufacture Practice in the North Thames Gas Board Area', Dr. J. Burns, G.M., Chief Engineer, North Thames Gas Board. Seaburn Hotel, Sunderland.

Sept. 27.—North Thames Gas Consultative Council: Westminster City Hall, Charing Cross Road, 2.30 p.m.

Sept. 29-Oct. 4.—International Bakers and Confectioners Exhibition, Olympia. Gas Council Exhibit.

News in Brief

A New Constructional Shop for the Power-Gas Corporation, Ltd., Stockton-on-Tees, has just entered into production. This addition to the company's productive capacity has a floor area of 132,000 sq. ft. and is designed to handle mild steel, stainless steel, and other plate work as required by the gas, chemical, oil, and iron and steel industries.

A Course of Six Lectures on 'Quantum Theory of Metals' will be given by Professor C. A. Coulson, M.A., D.SC., F.R.S., on Tuesday evenings from 6 to 7 p.m., beginning on Tuesday, October 30, at the Sir John Cass College, Jewry Street, Aldgate, E.C.3. The lectures will be addressed to post-graduate and advanced students, including those reading for the B.Sc. (Special) degree in physics or in chemistry or for the B.Sc. (Eng.) degree in metallurgy, and will also be suitable for those, interested in the subject, who are engaged in research or industry. Application for enrolment form should be made to the Principal, prior to the opening date of the course. The fee for the course is 15s.

The Proceedings of the Conference on Heat Insulation, held under the auspices of the Joint Committee on Materials and their Testing, in conjunction with the Institution of Gas Engineers, at the Institution of Mechanical Engineers, London, on November 30, 1950, have now been published. They embody the text of the following four papers presented at the Conference, together with full discussions of them: 'Heat Insulation in the Refrigeration Industry,' by S. Richards; 'The Economics of Thermal Insulation in Building Construction,' by C. W. Glover; 'High-Temperature Insulating Materials, their Properties and Testing,' by J. F. Clements; and 'Medium-Temperature Insulation,' by E. G. Cawte. Copies of the Proceedings can be obtained from the Secretary of the Institution of Gas Engineers, 17, Grosvenor Crescent, London, S.W.1, at 13s. 6d. a copy, post free.

A Proposed High Court Action by West Hartlepool Corporation to test the validity of the new gas charges introduced in April, 1950, by the Northern Gas Board is not to be proceeded with following a revision in charges which removed West Hartlepool's particular complaint. The revision had levelled out charges in all the coastal belt with the exception of one or two places like Peterlee.

The Trade Statistics for June, 1951, issued by the Central Statistics Office in the Republic of Ireland, show imports of 14,446 tons of gas coal, valued at £73,672 as against 30,776 tons, valued at £140,190 in June, 1950. This brings the total of these imports for the first six months of 1951 to 130,394 tons, valued at £648,059, compared with 120,278 tons, valued at £560,305 in the corresponding period of 1950.

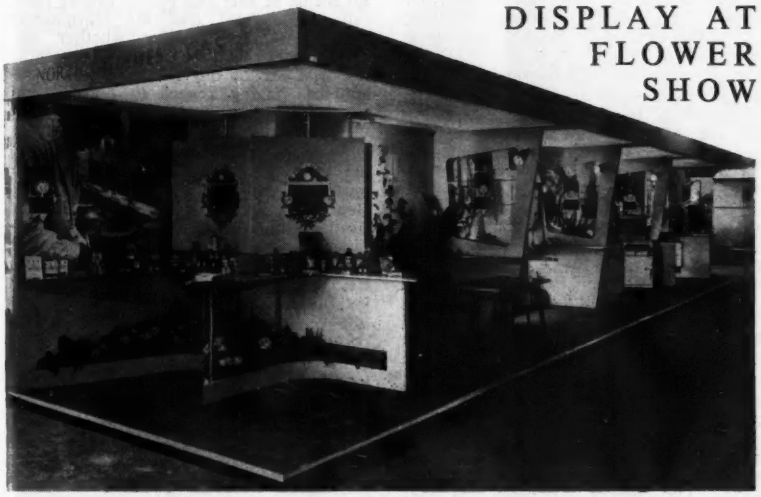
An Attractive Works Canteen has recently been brought into operation at the Willesden Works of Lancashire Dynamo & Crypto (Mfg.), Ltd. The opening ceremony was performed informally by Mr. D. C. Lorkin (Joint Managing Director), in the presence of Mr. H. W. Bosworth and Mr. J. G. Shaw (Chairman and Vice-Chairman respectively of Lancashire Dynamo Holdings, Ltd.). The accommodation is divided into four sections—the main canteen which seats 200 persons, a staff dining room seating 40, an executive dining room for 20 people, and a well equipped kitchen with a chef's office, store, refrigerator rooms and other offices. The kitchen equipment includes gas cookers and boilers.

Parkinson & Cowan, Ltd.—In connection with the recent issue of 3½% debenture stock in Parkinson and Cowan, it is announced that there has been some delay in the printing of definitive certificates. They may be ready by the end of August or early September.

Now Available in 'grey book' form at 2s. 6d. (post free) from the Institution of Gas Engineers is Communication No. 390/186, being the paper entitled 'The Use of Stored Liquid Methane to Meet Peak Loads at Gasworks' by G. G. Haselden and M. W. Reis, presented and discussed at a joint meeting of the Institution and the Low Temperature Group of the Physical Society on April 11 last.

The Quasi-Arc Company, Ltd., Bilston, Staffordshire, announce that arrangements are now in hand with the General Electric Co., Ltd., Witton, Birmingham, under which the Quasi-Arc Company will be the sole concessionnaires throughout the world for the G.E.C. Twin-Arc metallic arc welding process. The process will be demonstrated on the Quasi-Arc stand at the Engineering, Marine, and Welding Exhibition, at Olympia, next month.

DISPLAY AT FLOWER SHOW



The North Thames Gas Board had an attractive exhibit at the 'Evening News' Flower Show at Olympia. One section (illustrated here) told the story of the use of gasworks by-products in horticulture, while another was devoted to an effective display of domestic appliances.

International Welders Visit Durie Foundry

'I know of no other science or practice in this country that has made as much progress in the last 50 years as welding,' declared Mr. W. Lindsay Burns, Managing Director and Vice-Chairman of Henry Balfour and Co., Ltd., Leven, when he addressed welding and engineering experts from 11 different countries who visited the Company's works recently.

The visitors, 38 of them, some of whom were accompanied by their wives and families, had just toured Durie Foundry, Leven. This was part of their programme of industrial visits during a short stay in Britain as delegates to the International Welding Congress, staged in London and Oxford in connection with the Festival of Britain.

Despite language difficulties, the visitors gleaned a considerable amount of information on the various welding methods employed by the Balfour group of companies. Particular interest was shown in the 'Unionmelt' and 'Argon Arc' welding processes, both of which were demonstrated by the men on the job. The visitors spent a fair amount of time in the industrial X-ray department, examining the equipment and viewing radiographs of welds made to conform with Lloyds Class 1 standard for pressure vessels.

Later, at lunch at the Beach Hotel, Lundie Links, Mr. W. Lindsay Burns extended a welcome to the guests and gave a brief review of the progress made in welding over the past half-century. The thanks of the visitors to Henry Balfour and Co., was expressed by Mr. R. Nilson, Consultant Engineer, of Stockholm.

The delegates were from Finland, Sweden, Switzerland, Denmark, Belgium, France, Spain, Germany, Jugoslavia, Canada, and England.

INDIAN TRADE UNIONISTS VISIT NORTH WEST

A DELEGATION of six Indian and Pakistani trade union officials, who have been attending a T.U.C. course of training in this country, visited the Manchester H.Q. of the North Western Gas Board recently and had explained to them the new organisation of the industry under nationalisation.

Afterwards they were shown over the Stretford works of the Manchester Group by Mr. Harry Butters (full-time Board Member), Mr. John Wilson (General Manager of the Manchester Group of undertakings) and other officials of the Board. In attendance with them were Mr. Harold Hough and Councillor Jack Eccles (District Organisers of the National Union of General and Municipal Workers).

The members of the delegation (left to right in the group) were M. Sulaiman, B.A. (All Pakistan Confederation of Labour), Kalipada Mukerjee (Indian National Trade Union Congress), A. Qasim (All Pakistan Confederation of Labour), P. W. Khandekar, M.COM. (Hind Mazdoor Sabha), Hit Narayan Singh, B.SC. (Hind Mazdoor Sabha), and Sumant D. Desai, B.A., LL.B. (Indian National Trade Union Congress). Also in the photograph (left to right) are Messrs. J. Barrington (Station Engineer, Stretford), H. Hough, W. Hodkinson (Chief Technical and Planning Officer, N.W.G.B.), John Wilson, Harry Butters, Henry Abell (Industrial Relations Officer, N.W.G.B.), J. Eccles, Harry Vines (Canadian Railways) and F. Litler (Deputy Chief Technical and Planning Officer).

Industry and Public Services

The Institute of Public Administration seeks to answer the question 'Can the public services learn from industry?' in a series of six lectures organised for the autumn. The speakers are men with practical experience of both private and public enterprise. They are:

E. F. L. Brech (Senior Consultant, Urwick Orr and Partners, consulting specialists in organisation and management); A. E. Porter, C.S.I., C.I.E. (Administration Controller, Colonial Development Corporation, formerly Director, John Lewis Partnership, and Secretary to Government of India); F. R. M. de Paula, C.B.E. (Director, Electric and Musical Industries, Ltd., and other companies, formerly controller of Finance, Dunlop Rubber Co., Ltd., member of the committee appointed to review the organisation and administrative methods of the Inland Revenue Department); Sir Graham Cunningham, K.B.E. (Chairman, Triplex Safety Glass Co., Ltd., formerly chief executive and controller-general, Munitions Production, Ministry of Supply); I. J. Pitman, M.P. (Chairman and Managing Director of Sir Isaac Pitman and Sons, Ltd., and formerly director, Organisation and Methods Division, H.M. Treasury); and Major R. H. Thornton, M.C. (Member of the Board, British Overseas Airways Corporation).

These lectures will be held fortnightly in Livingstone Hall, Broadway, S.W.1, starting on October 8, at 6.15 p.m.

Copies of the programme can be obtained from the Institute at 76a, New Cavendish Street, London, W.1.

Instrument Training Courses

Industrial instruments require little attention, but they should be installed and maintained by engineers who are skilled and experienced in the work. Some of the larger instrument users have set up their own departments in training instrument engineers, but for many this is not practicable.

Elliott Brothers (London), Ltd., have for many years given training facilities to instrument users' staffs. The increased demand for instruction has led to the inauguration of regular training courses for which a special department has been established. These courses are available to employees of instrument users as a free service to industry. They are intended for engineers who have a basic knowledge of instruments and cover the theoretical and practical aspects of instrument maintenance and repair.

Elliott service training courses are held at the Company's head office at Lewisham. Each course lasts three weeks and the number of persons for each session is limited to 15. Particulars of the scheme, for which no fees are charged, and vacancies for forthcoming courses are obtainable on request to the Service Training Department, Elliott Brothers (London), Ltd., Century Works, Lewisham, S.E.13.

SURVEY OF BASIC FUEL USAGE

VISCOUNT RIDLEY, C.B.E., Chairman of Northumberland County Council and a member of the former Fuel and Power Advisory Council, has agreed to become Chairman of the Committee on National Fuel Policy appointed by Mr. P. Noel-Baker, Minister of Fuel and Power, to investigate the wider aspects of national fuel policy.

In a statement announcing the constitution of the committee on August 10, the Minister said that in the five years before the war the average internal consumption of coal in the United Kingdom was 178 mill. tons a year. In 1950, in spite of the fact that the household market had less, it was over 202 mill. tons. This year it may be 210 mill. tons. The electricity sent out by the British Electricity Authority is now 50% more than it was in 1946. The gas supply has increased by 25% in the same five years. The oil used has increased by 90%.

During the next few years, with the new burdens of the defence programme to be carried by an economy already at full stretch, all our productive resources will be under strain. Less than ever could we afford to waste any of them. The figures given showed that this was particularly true of fuel and power; we must certainly apply every possible measure that would help to make the best use of our supplies.

To advise him on this vital matter, he had established a committee with the following terms of reference:

'In view of the growing demands for all forms of fuel and power arising from full employment and the rearmament programme, to consider whether any further steps can be taken to promote the best use of our fuel and power resources, having regard to present and prospective requirements and in the light of technical developments.'

In addition to Lord Ridley the following have been invited to join the committee: Mr. Lincoln Evans, C.B.E., General Secretary of the Iron and Steel Trades Confederation; Mr. N. W. Gardiner, Technical Director of Huntley and Palmers, Ltd.; Sir Claude Gibb, C.B.E., F.R.S., Chairman and Managing Director of C. A. Parsons & Co., Ltd.; Professor W. R. Hawthorne, Professor of Applied Thermodynamics at Cambridge University; Professor W. A. Lewis, Professor of Political Economy at Manchester University; Mrs. M. Mackintosh, Tutor in Sociology at Bedford College, University of London; Member of the London County Council; and Miss M. R. Schofield, Housing Manager of Stoke Newington Borough Council.

Mr. Noel-Baker has invited the committee to survey the whole question of the use made of the basic fuels available—mainly coal and oil.

TIN AND ITS USES

THE current issue of *Tin and Its Uses*, published by the Tin Research Institute, carries illustrations of the opening of the Tin Research Institute's new laboratories by the Duke of Gloucester. During the past decade the demand for the Institute's technical service has expanded steadily and the range and scale of its researches have grown accordingly.

Numerous photographs of the new laboratories accompanied by descriptive matter give an impression of the many phases of the tin consuming industries covered by the work of the Institute. Of special interest is the industrial-scale equipment provided for hot-tinning, bronze casting, bearing testing, and electro-plating.

The tin mining industry in the Belgian Congo is described and illustrated and a map shows the location of these mining areas in the heart of the African continent. Some mines are situated in tropical jungle, others on lofty plateaus, but the most modern mining equipment and every possible labour saving device have been installed and a modern industry has brought education, hospitals, and better living conditions to what has hitherto been an inaccessible and backward area.

Alloy plating, in which the Tin Research Institute is a pioneer, is represented by articles on the new *tin-nickel* alloy coating and on tin-zinc coating. Some years of research have culminated in the discovery of a new tin-nickel alloy which can be plated bright, has a beautiful colour, and is as tarnish resistant as chromium.

Tin-zinc alloy coatings have been in industrial use for a number of years and a 1,500-gal. tank operating in Birmingham is mentioned. The coating is primarily used for its corrosion resistance and is the best known finish for iron or steel parts in contact with aluminium.

Tin and Its Uses and other publications of the Institute can be obtained free of charge on application to the Tin Research Institute, Fraser Road, Greenford, Middlesex.

Laboratory Index

Technical information about chemical products marketed under trade names in Europe and America is available at the D.S.I.R. Technical Information and Documents Unit, Lacon House, Theobalds Road, W.C.1.

The information is contained in 29 reels of microfilm and is a photographic facsimile of the I. G. Farben Central Laboratory Index. The index appears to have been compiled between the years 1933-1943, although a few additional notes are dated 1946, and it comprises more than 57,000 cards. The information is given in alphabetical order under trade names and includes the chemical name of each product.

Most of the entries refer to dyestuffs, but the index also covers resins, plastics, detergents, oil additives, insecticides, solvents, and other commodities. The index can be inspected at T.I.D.U. (Chancery 4411) by appointment and no charge is made for inspection. Photo copies of entries may be ordered and purchased.

Scientific Policy

The fourth annual report of the Advisory Council on Scientific Policy, whose function, under the chairmanship of Sir Henry Tizard, is to advise the Lord President of the Council in the exercise of his responsibility for the formulation and execution of Government scientific policy, reference is made to the shortage of scientists on a short-term basis, the need for employing highly qualified scientists in leading executive positions, and the importance of keeping fuel economy research going in spite of atomic energy developments.

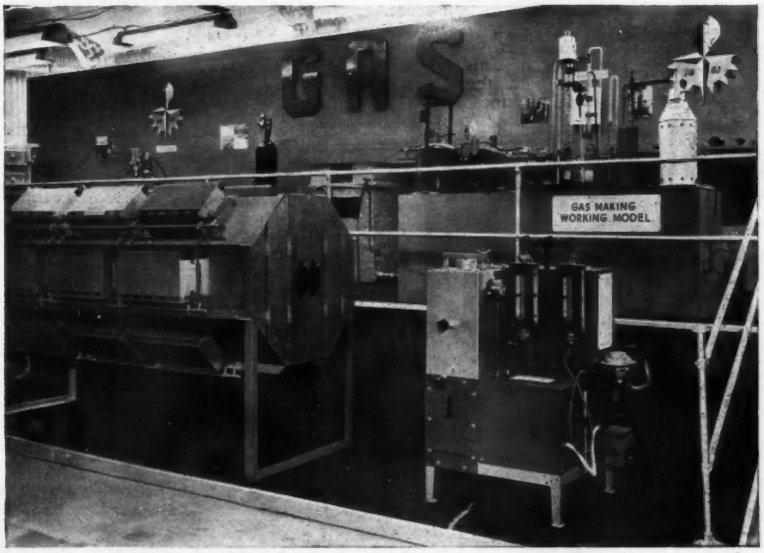
The term 'scientist' is taken as 'embracing engineers and technologists trained to graduate level or its equivalent in universities or technical colleges.'

Excess of demand over supply of scientists will be mainly the effect of the rearmament programme, for the 11,000 students now in the applied science departments of universities is over double the number before the war. Discussing plans for higher technological education, the report comments that the 1950 Report of the National Advisory Council on Education for Industry and Commerce received a 'mixed reception.' Expressing some sympathy with certain of the criticisms made, the present report supports the idea of an award separate from university degrees, but it puts the importance of expanded facilities for higher technological education in first place.

Increased demand will be made on British science and education by the implementation of the Colombo Plan for assisting the economic development of South and South East Asia. Requests may come for scientific assistance, and these, it is felt, should be examined by the various Governmental research councils, with a view to preventing isolation of scientists impairing the value of work done in the East.

On atomic energy, the Advisory Committee's view is that there is a reasonable prospect that atomic power can be developed on a large scale, and that the cost would not ultimately differ widely from that of power derived from coal.

SWANSEA INDUSTRIAL EXHIBITION



SWANSEA is one of the official centres of the Festival of Britain, and among the many activities sponsored by the Swansea Corporation was a five-day Industrial Exhibition in the Patti Pavilion towards the end of last month.

The Wales Gas Board participated with an exhibit designed to show a selection of the many industrial processes to which town gas is increasingly being applied in Wales, especially in the new industries recently established in the area.

Gas-fired plant typical of that in increasing use, particularly in processes demanding precise control, cleanliness and flexibility, included the following:

Controlled Flame steam boiler, fully automatic in operation.

De La Rue infra-red paint drying tunnel.

G.W.B. atmosphere-generating plant for purge gas for the bright annealing of metals.

Hancock & Co.—profile cutting machine, which was in operation throughout the period of the exhibition.

A model of a continuous drum spraying and drying plant by the Incandescent Heat Co.

Manchester Furnaces—high speed tool furnace.

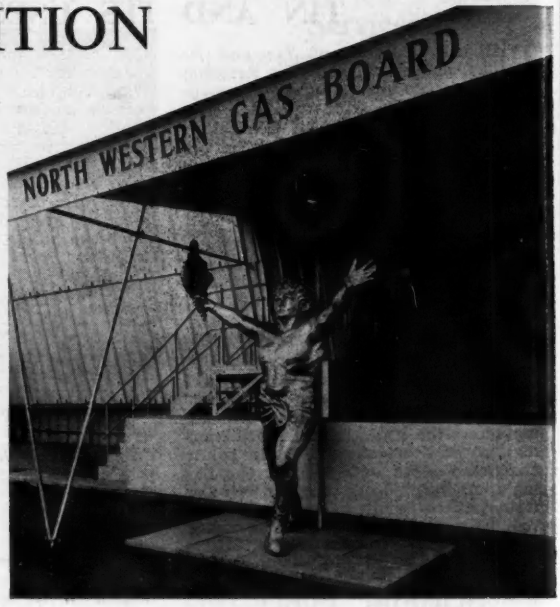
Selas Gas & Engineering Co., Ltd., G.L.C. type muffle furnace.

Potterton 'Rex' central heating boiler and an Ideal D.G. hot water boiler.

To complete the exhibit was a display of burners, photographs of gas-fired plant (installed in factories and workshops in Wales), and a working demonstration of automatic control gear and safety devices.

AMBITIOUS EXHIBITION at LIVERPOOL

The Liverpool Group of the North Western Gas Board staged a striking industrial exhibition in connection with the local Festival celebrations from July 23 till August 11. This proved an outstanding attraction to the public, who thronged the Pavilion to see the various working exhibits.



Exterior of Pavilion with the symbolic figure 'Gas—the spirit of Coal' and the B.M. meter exhibit.

THE exhibition bore the title 'Daylight on Industry,' and many firms from the Liverpool and north-west area showed their products and gave working demonstrations of manufacture.

The entrance to the Gas Pavilion was flanked by two artistic panels depicting on one side a large furnace and on the other a continuous baking oven. Upon entering, to the left was arranged an industrial burner display in continuous sequence operation, this being lent for the occasion by the North Eastern Gas Board, who designed the unit for the British Industries Fair.

An existing brick structure was made use of to stage a display of boilers for central heating and steam raising, this display being dominated by an 8C Cochran steam boiler, complete with all fittings, controls and pump, loaned by Messrs. J. & A. Riding, Engineers, Hoylake, Wirral. Boilers for central heating and hot water were also provided by Messrs. Ideal Boilers, Ltd., and Messrs. De La Rue & Co., Ltd. (Potterton Gas Division).

To the right on entering the Pavilion, a Hancock oxy-coal gas profiling machine was shown in operation, cutting various thicknesses of mild steel plate to templates. Continuing, the next exhibit was an attractive display of finished goods in the manufacture of which gas had been used. These included fibre glass and fibre glass cloth, paint brushes, false teeth, tools, toys, plastic coated cloth, clocks, a gas cooker and an electric refrigerator.

A North Thames Exhibit

Next to this display was shown a Weldex gas-fired air heater, and an air heater and controls designed by the North Thames Gas Board. Messrs. Bratt Colbran, Ltd., were represented by an infra-red tunnel, complete with conveyor. All these units were either in operation or capable of demonstration.

By arrangement with the South Eastern Gas Board, a pottery decoration and firing display was in continuous operation, this exhibit being staffed by two lady demonstrators of the Greenwich Pottery.

At the end of the Pavilion a demonstration of the blowing of chemical and artistic glassware was provided by Neonlite (Liverpool). Both these exhibits proved to be very popular and were constantly surrounded by admiring spectators.

An automatically controlled slot forge furnace, loaned by the Thermic Equipment & Engineering Co., Ltd., of Preston, and a double chamber Incandescent high speed tool furnace completed the working exhibits. This latter was provided with a Féry radiation telescope and indicator by the Cambridge Instrument Co., Ltd., arranged by the Liver-

In the left-hand photograph the Lord Mayor of Liverpool is seen in the Gas Pavilion with Mr. W. L. Howe (Group Industrial Sales Engineer), Mr. H. P. Lupton (Secretary of the Liverpool Gas Development Centre), and Mr. Frank Fisher (Group Sales and Service Officer). The other photograph is typical of the crowds which thronged the Pavilion.

The Gas-Fired Boiler Exhibit.

pool undertaking so that members of the public could read the temperature of the furnace upon pressing a button. The Incandescent Heat Company were also represented by an excellent model of a continuous roller hearth radiant tube furnace.

In keeping with the severely practical nature of the display, the walls of the Pavilion were decorated by blue prints of furnaces and plant mounted upon cream boards. Many well-known firms contributed to this display of drawings of furnaces and plant.

Upon leaving the Pavilion, the visitor was directed to ascend a staircase which led to a plinth covered by a canopy. Here a 20,000 cu.ft. per hour B.M. meter was compared with a domestic dry meter of 200 cu.ft. capacity. By special arrangement with Messrs. W. C. Holmes & Co., Ltd., the B.M. meter was fitted with a perspex viewing window in the top plate and illuminated from within. Since the meter also measured gas used within the Pavilion, the drum could be seen in actual operation, the rate of consumption being indicated on a 3-ft. dial by a pointer driven from the normal counter.

Under the same canopy a large gilt figure headed 'Gas—the Spirit of Coal' could be seen from most parts of the exhibition grounds.

The Pavilion proved one of the most popular with the public, and at times it was difficult to make one's way through the crowds which surrounded the various working demonstrations. By the time the exhibition closed, approximately 200,000 people had inspected this display.

Catering

In addition to this exhibit, the North Western Gas Board loaned to the authorities the gas equipment used for all cooking in the kitchen and restaurant marquees.

This consisted of:

Cafeteria Section

1—Radiation 24 ft. service counter (12 ft. hot and 12 ft. cold sections).

1—Stott Senior No. 1 instantaneous boiler.

1—Stott 38 'Regula' café set.

1—Stott 1A 'Regula' café set.

Kitchen

1—Main's 'Duke of York' double oven range.

1—Radiation 24/3 'Kingfisher' fish frying range.

1—Stott 6 ft. hotcupboard.

2—Radiation 36B 'Savoy' grillers.

1—Stott No. 1 vegetable and pudding steamer.

2—Stott stainless steel wash-up units including gas heated sterilising sinks.

1—Potterton No. 2 'Rex' storage set.

A 3,000 cu.ft. per hour meter supplied all the requirements of the kitchen and cafeteria. A large window was provided in the side of the kitchen tent in order that the public might see food being cooked. Over a period of three weeks, including the bank holiday weekend, approximately 13,000 main meals and 30,000 light meals were served, together with 68,000 cups of tea and coffee, or other beverages.

Satisfaction Expressed

The gas consumed for all culinary purposes over this period amounted to approximately, 148,000 cu.ft. The caterers, Messrs. S. Reece & Sons, Ltd., expressed their great satisfaction with the equipment provided, and stated that if necessary they could have dealt with peak periods of considerably increased numbers.

The North Western Gas Board has every reason to be proud of the success which attended both the display of industrial equipment and the catering facilities at the Liverpool Festival and much favourable comment has been received.

Mr. C. H. Leach, M.A., A.C.A., F.I.S. (General Manager, Liverpool Group of Gas Undertakings), assisted by Messrs. Frank Fisher (Group Sales and Service Officer), W. L. Howe (Group Industrial Sales Engineer) and H. P. Lupton (Secretary, Liverpool Gas Development Centre) was responsible for the exhibit, which covered an area of 80 ft. by 22 ft.

Looking through the Gas Pavilion.

Gas Stock Values

THE compensation values of two more gas undertaking securities were announced on August 13 as follows:

Spilsby Gas Company, Ordinary Shares (£10 unit), compensation value £6.

Woodhall Spa Gas Company, 5% Redeemable Debentures (£100 unit), compensation value £103.

Conversion date was August 13, on which date the securities were extinguished and the holders become holders of British Gas 3% Stock calculated in accordance with the rates mentioned. The Minister of Fuel and Power has issued a Direction to the Gas Council to pay interest on September 3. The Gas Council proposes to discharge in full to the appropriate holders all outstanding interest accrued to April 30 on the British Gas Stock issuable by way of compensation.

Government Proposals and the Economic Situation

'Root Causes Must Be Tackled'

THE disturbing effects of the Government's proposals to meet the economic situation are the subject of a strongly worded statement issued by the Federation of British Industries. 'In present circumstances,' it says, 'it would be absurd to claim that there are any practicable measures which could at once dispel inflation or immediately bridge the gap in the balance of payments. But the root causes must be tackled and it is only by increased productivity and a reduction in the level of Government expenditure that a sound beginning can be made. The hard facts of the situation must be fully understood by the nation. Yet human nature is such that recovery will require not only determination of mind but also some material incentives—the opportunity to earn and retain some reasonable reward for greater effort, for greater skill, or for risks successfully undertaken. The Federation believes that it is only in such measures that there lies any hope of ultimately restoring a situation which, under present policy, is drifting out of control.'

In the opinion of the Federation the Government's proposals show an utter disregard for the necessity of maintaining a free flow of capital into industry, the encouragement of efficiency in production and commerce, and the preservation of an international financial market in this country.

The adverse balance of overseas payments, which has been aggravated by a rise in cost of imported materials and foodstuffs, must be redressed. This will involve an increase in exports or a reduction in imports and both present serious difficulties. Domestic prices have been affected by the rise in cost of imports but the main inflationary pressure derives from the high level of spending which has itself been inflated by the needs of defence and the scale of Government expenditure generally. In short, the total output of goods and services in this country is insufficient to maintain the present level of consumption (including capital outlay). There can be no remedy for this in the long term except higher productivity or reduced consumption.

Higher Productivity

It is emphasised that higher productivity requires greater effort from all, an adequate supply of materials, and the requisite capital equipment and services. It is not limited to factory output but relates to every field of activity. While a considerable advance in productivity has already been made in the manufacturing field (and this has been a significant factor in buttressing the post-war economy) substantial improvements are still to be obtained even though the result in the short term may be affected by insufficiency of some materials and the dislocation caused through switching over to production for defence. Outside the field of manufacture there is scope for greater productivity, notably in higher output of coal, more efficient operation of transport and quicker turnround of shipping.

The promotion of higher productivity depends on incentives and flexibility. It will not be secured by exhortation accompanied by the removal of almost every incentive other than the desire to survive or by attempting to place the economy in a strait jacket of restrictions. Effort, ingenuity, and courage in production and development must be stimulated and not frustrated.

Domestic Demand and Government Expenditure

A major factor in creating domestic demand arises from Government expenditure. So far as this concerns defence it must receive first claim. Many other objectives, however desirable in the ultimate, should be postponed until conditions permit of their attainment without jeopardising the national credit. In creating a psychological background towards restraint in demand the lead should come from Government. The country cannot be blamed for failing to recognise crisis conditions when public expenditure remains at the present high figure, and when the only action proposed is the course of limiting dividends and instituting more price controls on a basis hardly calculated to promote efficiency.

Prices advance with rising costs, and profits inevitably bear a relationship to current price levels. Profits earned in the last year or so have reflected not only the sharp rise in prices of materials following devaluation and the world-wide scarcity aggravated by events following the outbreak of the war in Korea, but also the employment by industry of the additional capital in use since the end of the war and the increased volume of business particularly in the export market.

Profit is a small element in price but is an essential factor in the maintenance of industry. It is mainly from this source that funds have to be found for the increased working capital necessitated by the rise in price levels and to finance that modernisation and development which is vital to the preservation of efficiency, the increase of productivity, and the maintenance of operations. Over half the profit earned is drained away by taxation and the proportion distributed as the reward of the owner of the capital who has risked it in the venture is small. Yet this distribution is vital, not only as a reward for risk taking, but in order to maintain the flow of new capital, which is the life-blood of enterprise.

Limitation of Dividends

As a direct means of reducing purchasing power and inflationary pressure the limitation of dividends is insignificant. The total purchasing power represented by distributed profits is a small proportion of the total income of the people and the amount represented by recent increases is negligible. Distributed profits judged by any reasonable standard have shown a smaller increase than almost any other form of personal income. Greater restraint has been exercised in this field than in any other. The people who for some years voluntarily observed restraint are now to be penalised.

More serious is the rigidity which will be introduced into the financial structure and the repercussions which this may well have on the raising of risk bearing capital. Industry is already seriously perturbed about the ability to provide the capital to maintain operations because of the heavy burden of current taxation; the introduction of legislation which will create difficulties in the raising of new capital will make this situation more grave. This legislation is bound to influence British capital to seek an outlet overseas, militate against the investment of foreign capital in this country, and shake confidence abroad in our financial stability.

Discussing the remedy, the F.B.I. statement says: 'The central responsibility of the Government is to establish a sound national economy. The economy cannot be sound nor can employment and living standards be maintained if conditions are created in which enterprise is stifled and the level and efficiency of industrial and commercial activity fall. These are the results to be expected from restrictions and a too lavish expenditure on national account. What is needed today is the reverse—an encouragement of higher productivity and a careful husbanding of the national income.'

Factory and Storage Premises

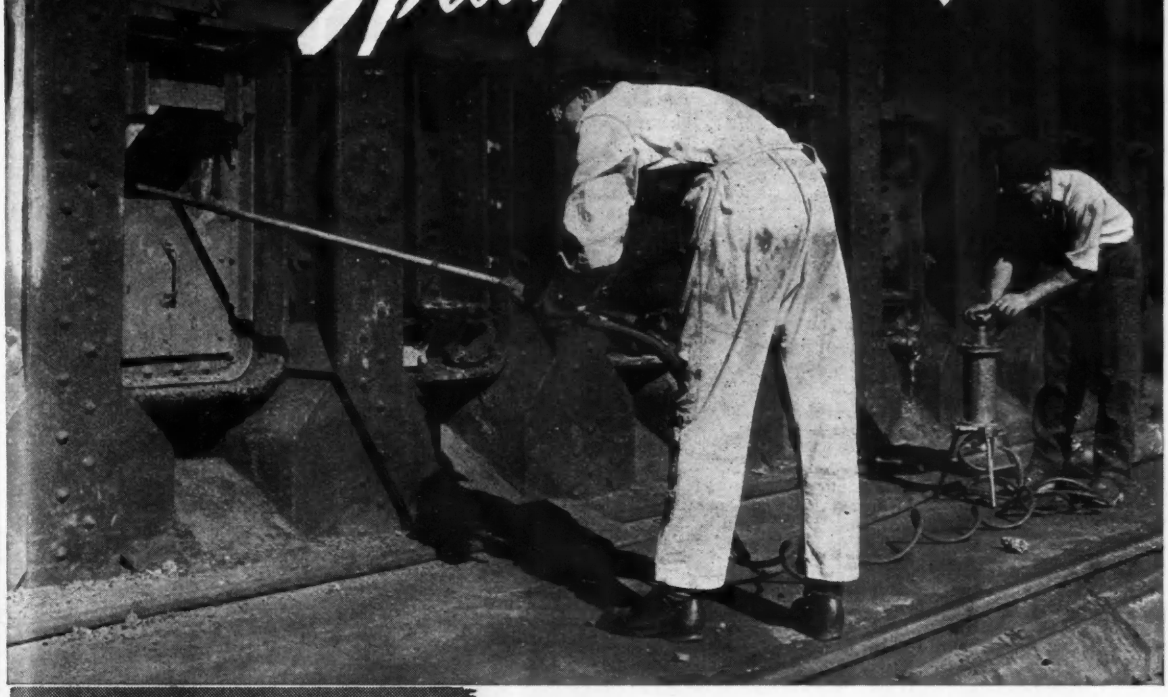
As part of the Government's defence plans, it has been decided to set up a small organisation within the Board of Trade to pave the way should it be necessary in an emergency to establish at short notice a Control of Factory and Storage Premises on the lines of that which operated during the last war; in addition, the organisation will assist the departments concerned with the provision of storage accommodation in connection with the rearmament programme.

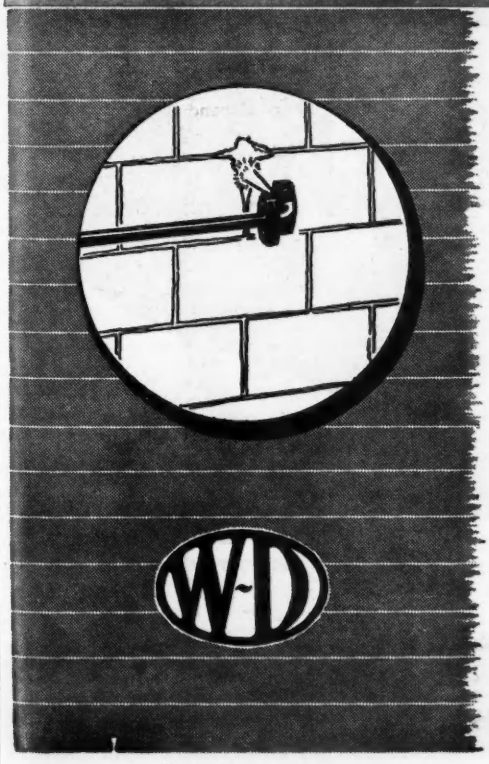
At the invitation of the President of the Board of Trade, Sir Philip Warter, who was Controller-General of Factory and Storage Premises during the last war, has agreed to take charge of the work on a part-time basis.

Sir Philip Warter commenced his duties on August 1 and he and his staff will be accommodated in the new Government Building at Horse Guards Avenue.

PROLONG THE LIFE OF YOUR COKE OVENS BY—

Spray Welding





Developed from the pioneer work of the Birmingham Gas Department the Spray Welding Process enables the walls of coke ovens to be repaired whilst they are *hot*.

Briefly—a dry powdered refractory material is applied in a fused state by means of an oxy-coal-gas flame to the defective area and there welded to the refractory structure.

Both the extent and the location of the weld are controlled by the operator. Holes can be filled, joints closed and eroded areas built up.

THE WOODALL-DUCKHAM VERTICAL RETORT AND OVEN CONSTRUCTION CO. (1920) LTD.

WOODALL-DUCKHAM HOUSE, 63-77, BROMPTON ROAD, LONDON, S.W.3.

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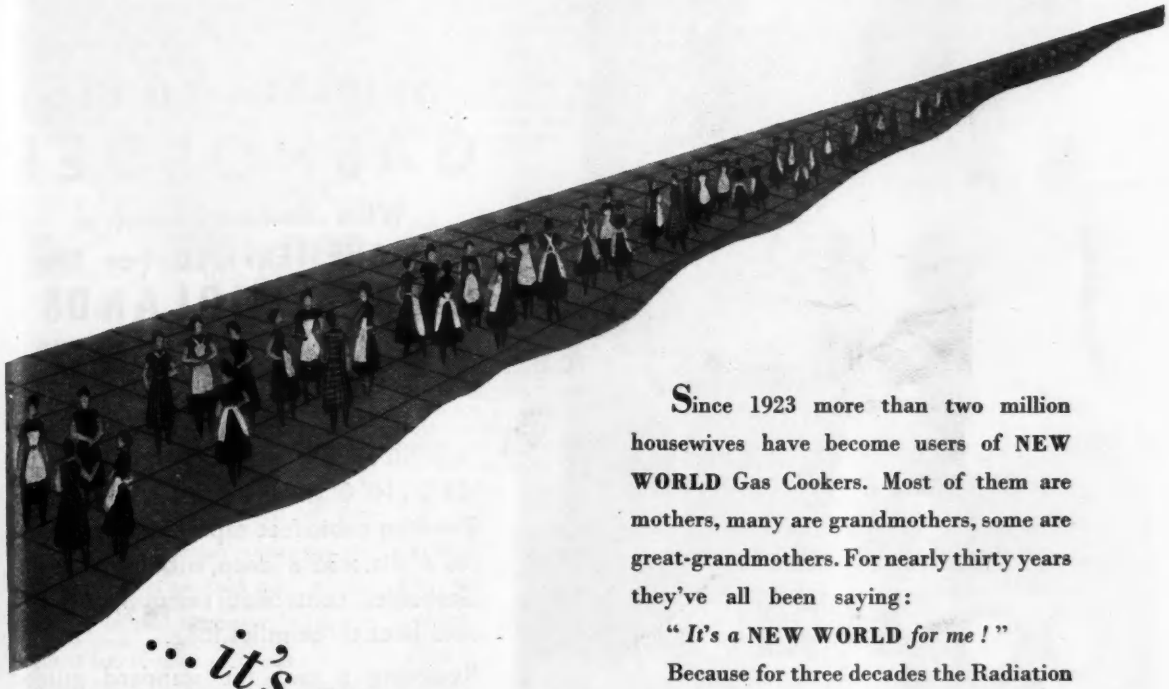
NEW WORLD NEW WORLD NEW WORLD

satisfied housewives_



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NEW WORLD

PRODUCT OF Radiation Ltd.

for me!

Since 1923 more than two million housewives have become users of **NEW WORLD** Gas Cookers. Most of them are mothers, many are grandmothers, some are great-grandmothers. For nearly thirty years they've all been saying:

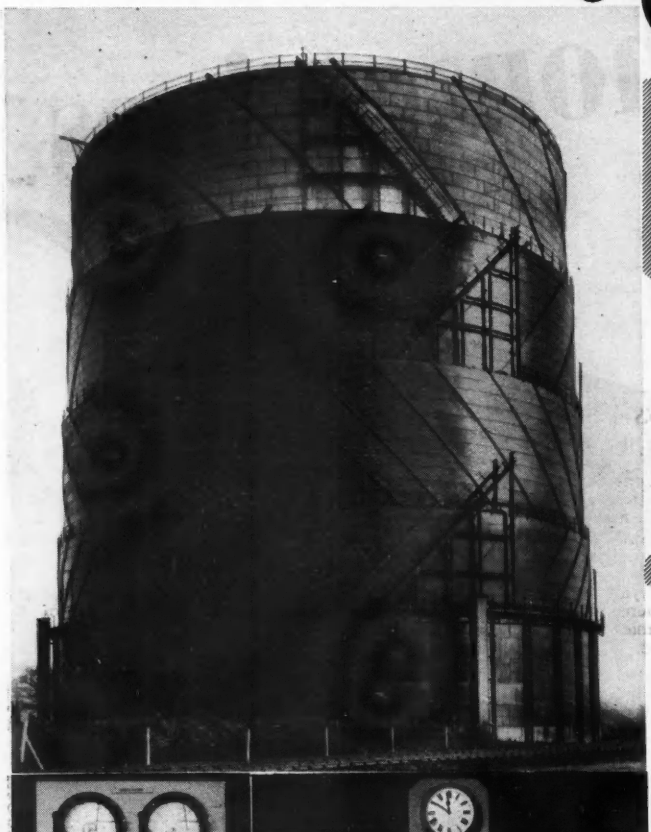
"*It's a* **NEW WORLD** *for me!*"

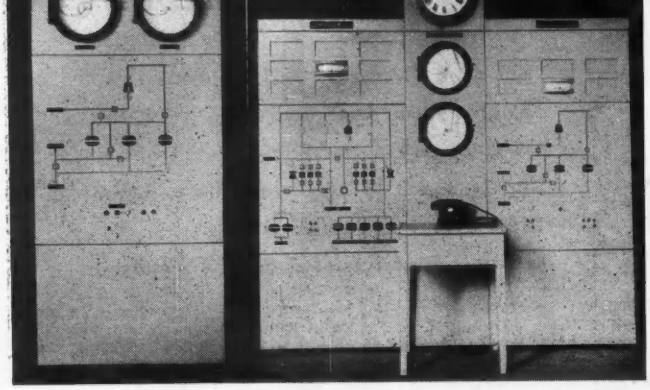
Because for three decades the Radiation policy of Research . . . Development . . . Improvement has produced ever better cookers, easy to install and to service, easy to clean and to keep clean, handsome in appearance, economical in use of gas. That is why housewives of today and tomorrow will go on saying:

"*It's a* **NEW WORLD** *for me!*"

NEW WORLD NEW WORLD NEW WORLD

Two Million Cubic feet





SPIRALLY GUIDED

GASHOLDER

With Remote Control

AT CHESTERFIELD For The

EAST MIDLANDS GAS BOARD

Four lift spirally guided Gasholder 135′ 0″, 138′ 0″, 141′ 0″ and 144′ 0″ dia. x 34′ 6″ deep, 2 million cubic feet capacity in steel tank 146′ 6″ dia. x 35′ 3″ deep, with foundations. Gasholder controlled remotely by two land lines three miles long.

Replacing a two lift standard guided Gasholder 155,000 cubic feet capacity in steel tank.

A further contract for a Gasholder of similar capacity at the Gas Works, Chesterfield, has also been received.

Illustrated on the left are the instrument panels with line diagrams at the Gasholder Station, WHITTINGTON and CHESTERFIELD.

DE

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B.W.

AMERICAN SPOTLIGHT

Items of Topical Interest from the Contemporary Technical Press of Canada and the United States

GAS BEYOND BELIEF

FRANK A. MORGAN, one of the nation's leading geologists, declared that the undiscovered reserve of petroleum and natural gas in the United States 'is large—perhaps beyond belief.'

Mr. Morgan, President of the American Association of Petroleum Geologists, and vice-president of Richfield Oil Corp., Los Angeles, made the statement in a discussion of 'The Effort that Finds Oil' before the spring meeting of the American Petroleum Institute's Division of production in the Biltmore hotel, Los Angeles.

He told the west coast oil men that there are more than 2 mill. square miles of sedimentary areas in the United States and its continental shelves in which search can be made for the buried structures or traps suitable for the accumulation of oil. (*Gas Age*).

* * *

A PROBLEM SOLVED

DURING the past winter the Hamilton by-product coke ovens effectually cured an annual headache. They have a machine for cracking fuel oil into high B.Th.U. gas as an auxiliary supply to meet peak loads in cold weather.

One undesirable by-product of this process is an emulsion of tar, naphthalene, and water which clogs up the system and presents a disposal problem. The water in the emulsion runs as high as 70%, and excessive foaming prevents putting it in the dehydrator. Further more, it does not separate out to any extent if left to stand in storage.

Amine 220 is the name of the chemical which enabled them to beat this problem. It was added continuously a drop at a time to the liquor at the wash box. One half gallon sufficed for a 24 hour run, with a liquor flow of 5,000 gallons per hour. Small as the amount was it did the trick. The emulsion broke up and the tar settled to the bottom of the tar-liquor separator. From here it was pumped into storage where further separation occurred, leaving a good light tar with a water content of 1% or less. (*Canadian Gas Journal*).

* * *

NEON SIGN IN DESERT

A NEON sign in the Saudi Arabian desert is helping to sell gas appliances to the faithful making the annual pilgrimage to Mecca. It is part of the Servel company's publicity drive in the Middle East and Europe, which is a fertile market for American equipment even though handicapped by lack of dollars.

Servel has been conducting a strong promotion and education programme in the Middle East. The two-pronged plan aims at (1) selling the American gas appliance industry itself by the benefits of ranges, refrigeration and air conditioning; and (2) selling the Servel product.

An important angle stressed in conjunction with the former is the need for refrigeration for storage of medicine. Servel's overseas sales organisation is now operating with one or more distributors in each of the eastern countries. In turn, the dealers these distributors have formed their own dealer organisations. (*Gas Age.*) [Let us hear what our British appliance manufacturers are doing about this.—Ed. *G.J.*]

* * *

'GRACIOUS LIVING'

THIS was the theme of the mid-summer promotional campaign launched by the American Gas Association as the co-ordinated promotional plan for the entire gas industry. Backing the national advertising sponsored by the Association and by manufacturers of gas appliances, two-colour portfolios carrying promotion helps and sales suggestions were mailed to gas utility companies and dealers throughout the nation.

Gas house heating and gas refrigeration were highlighted as offering especially good sales opportunities during the summer months. The portfolio points out that summer is the time when most people are ready to instal new house heating equipment. Utilities, manufacturers, and dealers can avoid seasonal peaks and rush orders for heating equipment in the early fall months by campaigning now for installations. (*Gas Age.*)

* * *

WHEN NATURAL GAS ENDS

THERE will come a time when natural gas reserves will become exhausted; but, at that time, this new efficient system of transportation will be available for connection to huge plants, built at the mouth of the mine. which will make synthetic gas of approximately 900 B.Th.U. that will be transported to market and delivered to the same burners that are now using natural gas So that, in fact, we are constructing a vast transportation system that will make energy available to markets in the most efficient manner and will make possible the utilisation of the total energy resources of the United States at the least cost to the consumer. Rather than the natural gas industry's expansion disrupting the nation's economy, it is building a more stable and efficient economy for the use of our natural resources. (*From an address by Paul Kayser at the A.G.A. Natural Gas Department Spring Meeting.*)

AS OTHERS SEE US

THE following paragraph is reproduced (without comment!) from the *Gas Age* of June 21:

The Thetford, England, gas board has installed its latest type of gas lamp in front of a friendly competitor. The new lamps were installed outside the windows of the local electricity board. A gas official explained that he thought the gas lamps might be useful during power cuts.

* * *

UNDERGROUND STORAGE

A 48,000 mill. cu.ft. underground storage project has come into full operation near Depew, Oklahoma. The project is designed to deliver about 200 mill. cu.ft. daily under full capacity. It is the third and largest to be operated by the Oklahoma system.

The underground facilities will supply an estimated 15% of the total heating season load. During the summer months, residue gas from the West Edmond Field gasoline plants and other central Oklahoma areas will be stored in the Depew field. The area is an abandoned gas field, which once had more than 20 wells in operation. (*Gas Age.*)

* * *

ACCURACY PAYS

A RECENT report of the Peoples Gas Light and Coke Company, of Chicago, shows that out of 10,125,499 actual readings made in 1950, only 8,178 were wrong. To have no errors would be more to our liking, for the handling of some 8,000 or more error complaints must cost considerable money. However, we doubt if any gas company has any better record than the Chicago company.

That organisation recently awarded cheques to many of its meter readers who were accurate in meter reading work. William Morgan, whose record of accurate meter reading would more than likely rock the foundation of his department if he failed to bring in a perfect score, was presented with the largest cheque of $260, for accurately reading meters for 17 consecutive years. Surely this is something to be proud of? Possibly it would not be a bad idea to pass information of this kind along to our various meter reading staffs throughout Canada, but, better still, just add an incentive for accuracy, while at the same time insisting in accuracy, whether there is an incentive or not. Deductions for every error might also help. We believe the Chicago company sets an incentive award, but deducts from it a certain amount for every error. (*Canadian Gas Journal.*)

THE PRACTICAL SIDE

By A. FORD

We publish below the paper which won first prize in the National Competition for Gas Salesmen, sponsored by Gas Service. The author entered the service of the Gas Light and Coke Company as an apprentice in 1911, gained practical experience in all departments, and in 1914 obtained his first certificate in the City and Guilds Examination in Gas Manufacture. He served in France with the Royal Flying Corps from 1916 to 1919 and on return took up duties as fitter and assistant foreman. He was promoted to assistant inspector in 1923, transferred to Brentford in 1926 on the amalgamation of the Brentford Gas Company, and in 1930 to the New Housing Section, Special Services. He is now carrying out the duties of Senior Representative, New Housing Section, Headquarters Division, North Thames Gas Board

MUCH has been written on new housing procedure, in the form of policy, methods of approach, etc., but I feel that there is much to be discussed on items arising from the practical viewpoint, both before and after an order has been obtained. I refer to such fundamental matters as:

(1) Suggested standard positions for the termination of services, risers and internal installations.

(2) Some of the difficulties encountered and methods by which they have been overcome.

(3) Items of interest in connection with the design and fixing of some of the later types of appliances or fittings.

It might perhaps be argued that the practical application is the responsibility of the service section, to which I agree, but the whole of the work carried out by the fitting staff has at some stage to be discussed by the representative with the architect, builder, or owner, and more often than not at a stage when plans are being prepared, many months before building is likely to commence.

Generally speaking, items on which a discussion is necessary arise in the following order:

Mains are the sole responsibility of the divisional mains superintendent.

Services are also the responsibility of the divisional mains superintendent, and their position and size can only be decided in conjunction with the representative who has previously arranged the meter position.

On the North Thames Gas Board's Western division, in the case of houses the Distribution Section lays the service right to the meter position, and in blocks of flats to a point above the concrete on the ground floor ready for riser extension at a later date. This arrangement has many advantages to all concerned, the chief of which being that all services laid out clear of the building are now positioned in relation to the depth of the main.

Pipe Ducts

Opinions differ on the question of whether or not pipe ducts should be used for services under solid floors, and in order to arrive at an acceptable decision it is necessary to establish their function. The answer would seem to be that if ducts are provided and at a later date the service has to be withdrawn, the work entailed would be comparatively small, but as the meter end of the service is eventually covered by varying depths of concrete and could only be cut out by mechanical means, often in a confined space, the costs may be so high as to warrant the exclusion of the ducts.

Another, and I suggest a greater, factor, is that in the event of an earthenware pipe duct being used, it is essential that all joints are properly sealed as are earthenware pipes for drains; otherwise there is nothing to prevent an ingress of water, which in time would have the effect of decaying the wrapping and eventually the pipe itself. In addition, the cost of earthenware pipes, plus laying correctly with the recognised fall towards the main, would have to be borne by the builder, and is an item not usually allowed for in the specification. The cost of laying an earthenware pipe to our requirements is approximately 3s. to 3s. 9d. per foot.

Yet a further point against the installation of pipe ducts is that in the event of a fracture of the service, the whole of the escaping gas would travel along the duct to its extremity, finally escaping at one point, whereas, if the service is surrounded by concrete, the escaping gas would percolate through the concrete in smaller quantities over a larger area, and is likely to be discovered and dealt with before the concentration becomes large enough to be dangerous.

My own experience is that where services have been laid in ducts, the latter have been broken by the hardcore being tipped carelessly into position before the service has been connected to the main, making it impossible to withdraw the service or renew in the existing position.

A practice frequently used but always to be discouraged is the punnering or rolling of hardcore after the service has been laid in position, whether in a duct or otherwise. The reason for this is well known; and if this practice is allowed, a fracture is likely to occur and would not be located until building progress had reached such a stage as to make renewal a difficult and costly task to all concerned.

In view of this, it would seem that the use of pipe ducts should not be encouraged and that a service pipe wrapped and coated, correctly laid on a firm base and further protected by a covering of sand and cement prior to concreting, is all that can be desired.

The duct, by the way, should not be confused with the sleeve which *may* be fitted in all external walls at the point of service entry and *must* be fitted in all cavity walls through which the service passes. The annular space between the external surface of piping and internal surface of sleeve should not be less than 1 in. and must be filled with sand and cement throughout its entire length, the sleeve itself protruding not less than 1 in. clear of each side of the external wall.

The importance of the sleeve in a cavity wall is based on the knowledge that due to difference of temperature between the outside air and air in the cavity, condensation is likely to form, and if allowed continually to trickle down the walls and settle on the service pipe, corrosion may eventually lead to an escape, with the result that gas is discharged into the cavity and allowed to travel throughout the walls surrounding the building. The protrusion of 1 in. of sleeve inside and outside the building is for the same reason, that in the event of condensation or rain, moisture would run round the sleeve to the bottom, the service being protected at all times.

Continuing with the service, the next point that arises is where to terminate in order to provide a neat meter fixing in a convenient position, and at the same time show some consideration to the electrical contractor who, in addition to a rising

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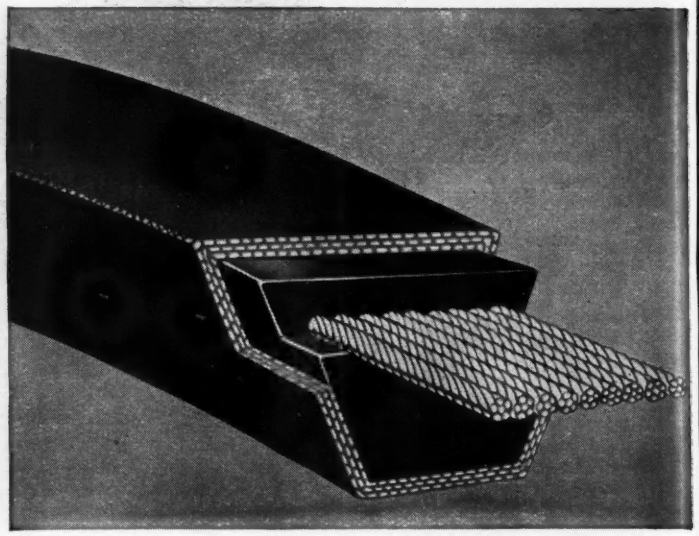

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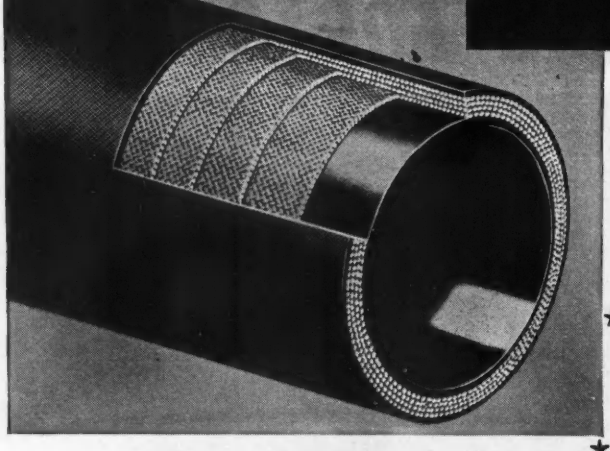

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main, has many more supplies to juggle with, all of which may emerge from the base of the meter cupboard at every conceivable angle. Briefly, my answer to this would be to terminate the service on the right-hand side of and as near to the meter as possible, delaying my reason for this until a later stage, as it is so closely associated with the internal installation and meter fixing.

Meter Position—Meter Cupboards

Fortunately, more thought is now being given by architects and planners to the provision of meter cupboards; and whereas in the past the meter position seemed to have been ignored altogether until the question was raised by the representative, who often had to be satisfied with a not too good position in the only space left over, it is pleasing to observe the increasing number of plans now being received on which space has been allocated for meter positions and, in many cases, a properly constructed meter cupboard.

It is felt there are several reasons for this agreeable change of ideas, one of which is probably that in the very earliest type of post-war dwellings, the prefabricated ten-year type, all had a separate meter cupboard and it seems that local authorities in particular were quick to realise the necessity to cover the meter from view in a position convenient to both the gas board and the consumer.

The size of meter cupboard will naturally be left to the architect to decide, provided he has previously been primed with meter sizes and space required for connections. In the event of his planning in accordance with British Standard 1396-1947, 'Gas Meter Cupboard for Domestic Premises,' ample room is available for the 200 ft. S.H.C. automatic meter, the largest which is likely to be required in the average house or flat.

As a popular design of meter cupboard extends from floor to ceiling, divided horizontally to house both gas and electric meters, our obvious choice is for the upper portion with a dividing shelf approximately 4 ft. 6 in. from the floor. There seems to be little difficulty in obtaining this better of the two positions, and no opposition is raised by the electricity board; in fact, at recent discussions with their representatives it was understood that they prefer the lower portion. This is a most satisfactory arrangement and could be termed a safety measure. If fitted in the reversed position—*i.e.*, with the gas meter in the lower half—in the event of an escape the gas in rising would pass over the electric supply, meter and fuse boxes, with unpleasant consequences if at the same time a short occurred in the upper portion.

Meter Fixing

It would probably be difficult to mention any subject which has created more discussion than that of meter fixing, and if we examine a meter recently fitted there would appear to be little difference between the method now used and that used many years ago; both employed lead pipe and blown joints. Other methods have been practised, such as the meter bar, copper, and flexible connections, all of which had their advantages, and as I am informed a Committee is now studying the question more fully, I am sure we all look forward to the results of their observations.

On one point we must all agree, and that is that the amount of work involved in the fixing of a meter and the appearance of the finished job is controlled by the position of inlet and outlet supplies. Where then should these two supplies terminate?

This again is a question with many answers, varying according to individual preference and past experience. Reference to publications issued in the past on meter fixing invariably shows the inlet and outlet supplies at least the width of the meter apart, with either inlet left and outlet right, necessitating swan neck or U-bend connections, *or* inlet right and outlet left with cross-over connections.

It seems that one of the reasons for this method is to reserve a space for the meter which will be fitted some time later. In practice, however, it has been found that the space between the two supplies affords a very convenient position in which to terminate an electric cable, which with an earthenware duct, does not permit the meter to be fitted in its intended position, there being insufficient depth in the majority of present-day cupboards.

In cases where this occurs, one or other of the supplies must be altered, but as by this time both supplies are set in concrete and cannot be moved without extensive cutting away at high costs, and in the event of inlet and outlet supplies being extended above ground, it is often difficult to carry out the work with the usual standard of neatness.

Agreed, errors of this nature should not occur, and probably a safe rule on which to work is that where a plan of the job is available, meter positions particularly and as much as is necessary of the internal installation should be plotted, coupled with the preparation of a specification with as much detail as possible, a copy of which would be passed to the fitters responsible for carrying out the work. It would not be fair to issue instructions such as 'Lay service to meter position under stairs,' or 'Leave water heater point over draining board,' and expect to find points in the exact position which only the representative has in mind.

Returning to the position of inlet and outlet supplies, may I quote my own preference, which for some time past I have been fortunate in arranging and which appears to meet the requirements of all concerned?

It has been suggested that the inlet position referred to in a previous section on services should terminate on the right-hand side of and as near to the meter as possible. The outlet supply, I believe, should also terminate on the right-hand side of the meter and as near to the service as possible, for the following reasons:

(1) Neater meter fixing, particularly if bent caps and linings are used.

(2) Minimum space required for meter and connections.

(3) Economy of labour and material.

Actually, inlet and outlet could be on the right or the left of the meter, preference being given to the former for the reason that more distance is necessary for the inlet connection.

Space does not allow a detailed description of all the points likely to be included in a standard installation and it is doubtful if anyone would attempt to suggest standard positions for any particular point, since it is partially true that apart from prefabricated dwellings, no two premises are identical; nonetheless, there seems to be no reason why a *standard practice* should not be adopted. For instance, take the cooker point.

Cooker Point

In a vast majority of cases, even when the cooker has been allocated a definite position the supply is brought through the floor approximately 2-3 in. from the finished surface of the wall, thus providing a most convenient niche for the collection of dust and fluff, being too small to allow for easy cleaning by brush or flannel. Assuming the point is left in this position, in the event of the necessity to extend the supply right or left, the work cannot be carried out with the usual standard of neatness and is certainly not inconspicuous.

How much better then to terminate the cooker supply through the wall at some convenient position above skirting height, say, 9 in. or even 12 in. from the floor, still leaving ample room for vertical rise and easy cooker connection. A further important advantage of this method of termination ensures that in the event of magnesite type floors being laid, the supply is not likely to be affected. Cases are known where a supply, correctly sleeved, extending through a magnesite floor, has eventually become perforated by the continued splashing of diluted acid during the process of floor washing. Points for built-in cookers would be positioned to suit the type of cooker and surrounding fitments.

D

Copper Point

If a census were taken of existing wash copper positions, the answer would probably show that 90% were fitted under draining boards.

A further census of the type of draining board would probably reveal that about 5% were removable; in other words, approximately 95% of the coppers fitted must be withdrawn prior to using. We can forget the 5% cases for the time being as the coppers are rarely moved when in use—in fact, they could be fitted with rigid connections, care being taken that the control tap is in a convenient position to operate.

In the 95% cases the situation is not quite so easy as more than one condition has to be fulfilled: First, ease with which the control tap can be operated; second, ease with which the tube may be connected and disconnected; and finally, provision must be made to enable the copper to be withdrawn without risk of the flexible tubing being damaged.

In order to meet these conditions, the ideal position to terminate the copper point would be on the right or left of and as near to the front of the recess as possible.

An opinion may be voiced as to the inadvisability of leaving a point approximately 15 in. from the wall with the risk of its being broken during building operations, but as the number of broken supplies on new buildings is comparatively small, it may be a risk well worth taking.

The alternative position, and I venture to suggest, one mostly used, is at floor level at the rear of the recess. How difficult from the consumer's point of view! In addition to being most inconvenient for access to tap and wing nut, it is probably the reason for so many broken tubes soon after occupation.

Furthermore, with the point in this position, and the recess being approximately 15 in. deep, using a 3 ft. standard length flexible tube, the copper with its side connection, pulled forward as much as possible, is barely clear of the opening when the tube is straightened to its limit. This difficulty would be partly overcome if, in addition to right and left hand connections to the burner, provision was also made for a rear connection.

Water Heater Point

If we think in terms of a water heater point only, very little time is required to decide on a position, but an answer should not be sought to the question without also reviewing other necessary details which, having been considered, automatically decide the position in which the point should be left.

In short, the point should be treated as part of a complete water heater installation, even though an appliance is not being fitted at the time the point is installed. Dealt with in this way, answers must be provided to two further main questions:

(1) If required, which is the most suitable type of water heater?

(2) Which is the most suitable position?

Both are determined by other factors. For instance, does the construction of the premises allow the fitting of a flue from appliance to outside air?

This is an item not to be overlooked nowadays, since in some types of property it has been found, particularly in the case of bathrooms, that the cubic content of the apartment has been reduced to the minimum, providing for the bare necessities only, and that it is almost an impossibility to fit a flued appliance. The situation is even worse in blocks of flats where often only one outside wall is available, the whole width of which, apart from a few inches each side, is occupied by a window, over which is usually a concrete lintel extending to ceiling level, and although a perfectly good position may appear from the inside of the building, a further reference to the plan may reveal that the outside position is already occupied by rain, soil or waste pipes, hopper heads, and ventilators, in addition to overhanging balconies.

Briefly then, our chief difficulty is in the question of ventilating, which without doubt will be largely overcome by the introduction of the balanced flue water heater.

It is pleasing to note that in addition to an order having already been placed for 40 of these newly designed appliances by the St. Pancras Borough Council, Hammersmith Borough Council have prepared plans for the installation of 24 in blocks of flats to be built. We look forward to their installation, which will provide us with additional information on fixing and performance.

The technique employed to determine the most suitable type of appliance being so familiar, it is not proposed to enumerate the order in which they are considered; nevertheless, it is intended to serve as a reminder in repeating that for premises likely to be occupied by the lower income groups, where usually a hot water installation is provided by means of a back boiler, the installation of a finned back boiler with gas attachment and all-fuel grate should not be overlooked, as in addition to its being 'an answer to the immersion heater,' we have one unit serving a dual purpose—*i.e.*, a gas-ignited solid-fuel space heater providing hot water in the winter—and a gas fired system for water heating in the summer.

Although final results of test of those already fixed are not yet to hand, the advantages claimed so far are that the finned back boiler is 20% more efficient than the average type of block back boiler, and with the gas attachment an easy method of conversion from solid fuel to gas firing is provided. Installation costs are reduced to a minimum, there being no addition to the normal work entailed in fixing other similar types.

Points to be borne in mind when considering the installation are:

(1) When the open coke fire is in use it is capable of providing an average of 250 gal. of hot water per week and, in addition, will heat two radiators and towel rail, having a total radiation area of not more than 35 sq. ft.

(2) The finned back boiler should only be used with an indirect hot water system.

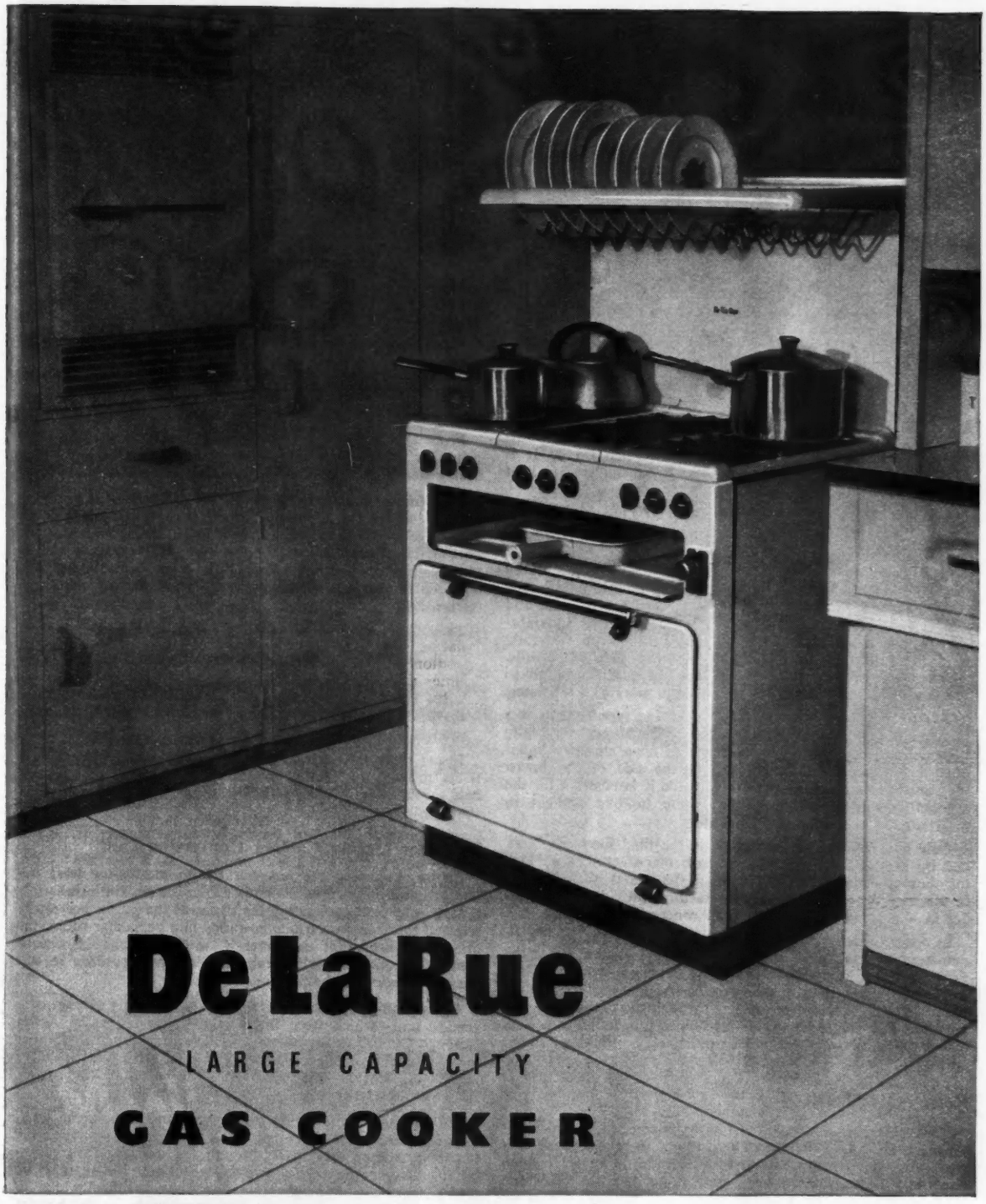
Returning to the theme of an earlier section, it is suggested that in cases where the point has to be left in any convenient position—*i.e.*, where the appliance is not being fitted at the same time—it should be left above the draining board or bath panel and not just above ground. The latter position is no doubt slightly cheaper and excuses the builder from preparing a longer chase, but in these days of built-in solid draining boards, sometimes of metal, and totally enclosed baths, the task of fitting a water heater at a later date is made much more difficult and is certainly more expensive.

Incidentally, our task will be made much easier in the future by the introduction of the 'jigged fitting' which is now being fitted in a number of new housing estates and makes provision for a neat, simple and inexpensive installation when the water heater is fitted. Only a comparatively small amount of additional plumbing work is necessary at the time of building construction, to provide gas and water supplies to which a water heater could be connected in very quick time, compared with previous methods of inserting tees and wall plugging, etc. The additional plumbing work referred to means an extension of approximately 18 in. of cold water supply from the kitchen sink, the cost of which is negligible compared with the saving on costs of appliance fixing. As the majority of jigged fittings with water and gas supplies will be concealed, it is important in ensuring correct appliance fixing, that the fitting is accurately secured in a truly vertical position, and parallel with the face of the wall.

Ignition or Fire Point

To decide on a convenient position for a fire point is not an easy task and it could be said that in whichever position the point is left, it is likely to be wrong—that is, from the neat fixing angle.

With wood floors and joists, it is not so difficult, as the point could be altered at a later date if necessary, but at the present time, due to timber shortage and solid floors being laid in larger numbers, much more thought is being given to this question. In a few instances it has been possible to arrange for a chase to be left from the termination point toward the fireplace, and not filled in until the fireplace is fixed, giving



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the opportunity of a further extension before the finished floor is laid.

It is naturally unsafe to mention the order in which various trades operate. Two builders on identical property may adopt different practices, and in order to determine the stage at which the internal installation should be carried out, let us consider one room, say the dining room, which would probably be completed in the following stages:

(1) Foundation.
(2) Boundary walls—fireplace openings.
(3) Hardcore filling.
(4) Oversite (varying thicknesses of concrete).
(5) Positioning of back boiler.
(6) Fireplace surround and hearth fitting.
(7) Laying of finished floor.

From this data it will be observed that the service work should be completed before stage (3), the internal installation should be completed before stage (4) unless provision has been made for chases to be left, and that normally some time elapses between stages (4) and (7), providing an opportunity to alter slightly positions of any points if necessary.

On the question of wall or floor termination, I feel the latter is the better of the two, for the reason that if the size of the surround is not known (and our difficulty only arises in these cases), the point should be left at the side of the breast, resulting in a still longer extension to the fire when fitted. It is generally agreed that any supply is less conspicuous when kept as near as possible to the floor.

Another item to be considered is the question of access to the control tap in cases where gas-ignited solid fuel fires are being installed.

Both wall and floor positions have now been catered for by the provision of the metal box comprising double union cock and restrictor for floor use, and the combined control cock and flex socket with plate for skirting use, manufactured for right- or left-hand connections. Both types of fittings have already been fitted in new property with pleasing finished results. Accuracy in positioning is essential as the gas connection to appliance must be carried out with a small margin of tolerance.

A case may be quoted where the skirting type control was requested by a local authority who are installing a specially designed surround 4 ft. 9 in. wide, fitted on a chimney breast only 5 ft. wide. Fitting the tap at the side of the breast (previously referred to) would have made it impossible for the average person to reach the tap while holding a light in the centre of the fireplace.

Only one position was available, in the tiled surround itself, and by arrangement with the fireplace manufacturers a block (of dimension a little smaller than the plate) was inserted in the mould at the time of manufacture, providing an opening in a position convenient to all concerned.

In order to carry out a concealed connection, the most suitable method was found to be to shorten the gas burner at the threaded end (the opposite end being flattened and drilled for set screw fixing), fit a ¼ in. by ⅛ in. end tee with ⅛ in. plug, the plug resting on and protruding through the casting for support, the ¼ in. centre being the gas supply connection to a ¼ in. Crane union elbow, the standard practice as with the Fulham all-fuel grate.

Refrigerator Point

Here is a point which, quite rightly, is receiving much more attention nowadays than ever before, not merely because it is part of a standard installation but because property owners have now become more refrigerator-minded, proof of which is obtained from the long waiting lists already compiled. Further proof is to hand of one local authority who, as a result of the Board's offer to hire refrigerators and cabinets canvassed their pre- and post-war tenants, each one receiving a simply worded questionnaire asking:

'Would you like a refrigerator, and if so, are you willing to pay ..... per week?'

as the result of which 171 replies have been received stating 'Yes.'

The Council's agreement with the tenant having been signed, and a quarter's rent having been paid by the tenant to the Council, addresses are forwarded to the Board, necessitating a call to obtain particulars of fixing. To date 28 have been ordered, some of which have already been fitted.

I am afraid I have strayed somewhat from the refrigerator point, but this particular example will serve to strengthen my statement that, like the water heater, the gas point is more or less automatically sited after a suitable position is found for the refrigerator itself.

In a number of the 28 cases referred to above, no thought had ever been given to the possibility of a refrigerator being required. Consequently it was no easy task in a small kitchen already equipped with gas cooker, copper, non-standard kitchen fitment, fuel cupboard, floor wringer and the usual kitchen furniture, to find space for the latest type metal cabinet measuring 3 ft. high, 1 ft. 11 in. wide and 1 ft. 10 in. deep.

Happily, a position has been found in all cases, but the local authority have to bear further expense by carrying out structural alteration to existing fitments. To this they do not raise any objection as they are as anxious as their tenants that the refrigerators shall be fitted.

From this order I feel we have gained a very satisfactory result for it is quite certain that in planning the kitchen of their next scheme, refrigerators will receive full consideration.

As a further point of interest on the positioning of refrigerators, a suggestion from us which has been adopted by some local authorities, who cannot install refrigerators at the time of building, is to reserve the lower half of the larder as the refrigerator position. Very little work is necessary at a later date should the tenant or local authority require a refrigerator.

Two points have to be borne in mind when negotiating:

(1) The door rail must coincide with the position of solid shelf.

(2) The solid shelf should be at least 3 ft. from the floor in order to accommodate the larger of the two possible models.

In the event of a refrigerator being required, the larger door is cut through the centre rail, the top half rehung, the bottom half taken away, leaving sufficient space for a built-in or free standing model.

Point for Drying Cabinet Conversion Unit

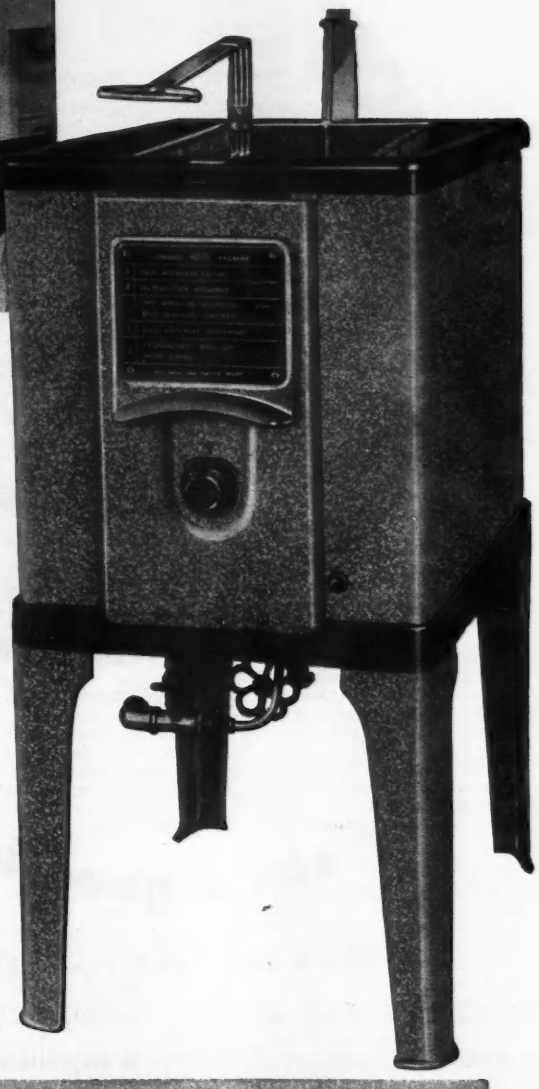
Before discussing the last but by no means the least important point in what we now refer to as a standard installation, it may be correct to mention that whereas the points previously referred to can have various positions in a particular room, the drying cabinet point can have various positions in various rooms, the cabinet itself being installed in a position to suit the construction of the premises.

As an example, since the first supplies of drying cabinet conversion units which were fitted in bathrooms for the Acton Borough Council, many more units have been supplied to other local authorities, etc., for use in blocks of flats, and are fitted in drying rooms for communal use, or in halls and kitchenettes for individual use.

With regard to the fitting of the unit and component parts, it is important to ensure that all air entering the cabinet via the lower louvre must pass through the unit, so in order to satisfy this condition it follows that the lower louvre must be fitted at the correct height from the floor. Difficulty due to door design may be experienced in some cases, as the bottom door rail must be at least 8 in. in depth to accommodate the louvre.

As the majority of present-day doors have rails much less than 8 in., this difficulty has been overcome by fixing the louvres in separate panels, the lower of which is hinged. This

In well-designed kitchens...



The Main No. GF91 Gas-Heated DEEP FAT FRYER illustrated is specially suitable for frying meats, rissoles, poultry, fish, potatoes, etc. It has a large-capacity one-piece pan of enamelled heavy cast-iron, a cool crumb-well being an important feature of the pan.

Its vitreous enamelled casing is fully-insulated and is mounted on vitreous enamelled cast-iron legs.

The Mainstat heat control and the temperature guide with splash-shield are located on the front.

The GF91 Fryer is complete with lift-off cover, wire basket, drain valve, main and pilot taps, burner and calorific-valve adjuster.

If you have any catering problem, large or small, write to R. & A. Main Ltd. They offer you the benefit of their long experience in the equipping of Kitchens, Canteens, etc. Layouts and estimates of cost will be gladly prepared on request.

MAIN

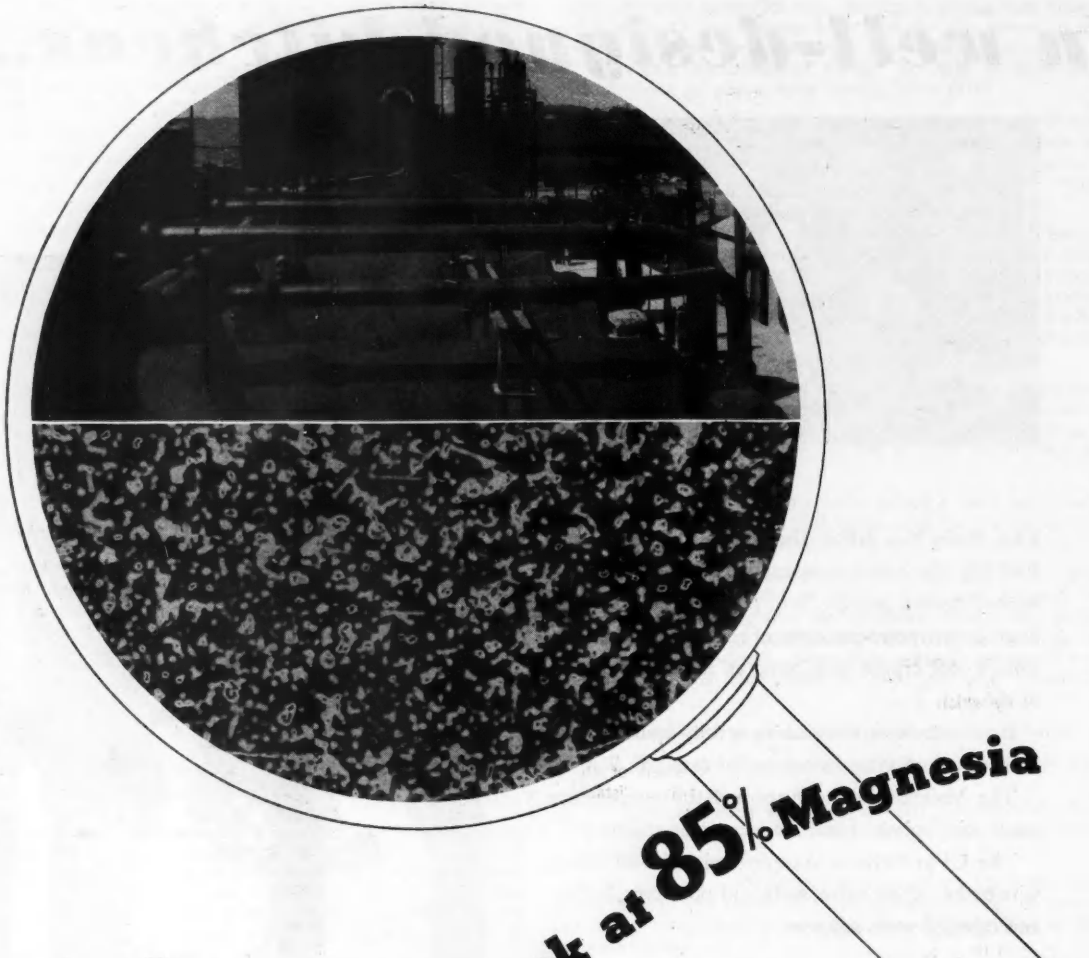
COOKING APPARATUS AND KITCHEN EQUIPMENT

Gas and Steam

R. & A. MAIN LIMITED

Gothic Works, Edmonton, London, N.18 and Gothic Works, Falkirk.

M.3



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Distribution of air cells *inside* insulation controls the efficiency. In Darlington 85% Magnesia a maximum number of these vital air cells is created and evenly dispersed by the regular crystal structure of magnesium carbonate. Darlington 85% Magnesia has all the characteristics which make it the ideal insulation for the gas industry.

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YOU HAVE A PROBLEM. *The technical division of the Darlington group of companies will design and instal an insulation scheme to meet your needs.*

Manufacturers:
THE CHEMICAL & INSULATING CO., LTD., DARLINGTON

Insulation Contractors: THE DARLINGTON INSULATION COMPANY LIMITED, NEWCASTLE UPON TYNE.
Sheet Metal Fabricators: S. T. TAYLOR & SONS, LIMITED, TEAM VALLEY, GATESHEAD UPON TYNE.

method also facilitates easy access to the unit for lighting and cleaning.

Arrangements have also been made in some instances to deliver the louvres to the door manufacturer who, after fitting, is able to deliver the door ready for hanging. No further cutting on the job being necessary, this arrangement shows a considerable saving in labour costs.

The unit should be in such a position in the cupboard that it almost touches the door when closed. In the event of this not being possible, a batten should be fixed on the inside of the cupboard door above the lower louvre, thus preventing air from travelling vertically inside the cupboard before having first passed through the unit.

The question of gas and electric supplies crossing and sometimes touching has been more apparent in post-war properties than pre-war, due mainly to the increasing number of solid floors of insufficient depth now being installed, this being more noticeable in the case of flats than houses in which wood floors are still being used on the first floor. However carefully gas and electric supplies are positioned, quite frequently it occurs that at some part of the installation the two supplies must cross one another, and in order to decide, first, the method of insulation at this point, and secondly, who is responsible for work entailed a meeting was arranged with a representative from the electricity board.

At the conclusion of a very friendly discussion, it was agreed that in all future schemes the responsibility of insulating is that of the board which is last to complete, and that an effective and inexpensive method is by slitting lengthwise approximately 3 in. or 4 in. of good quality hose and slipping it round one or other of the supplies, no fixing being necessary. In the majority of jobs it is found more convenient to cover the electric supply which is usually ¾ in., and is the smaller of the two.

The question of disintegration of the rubber over a period was also considered and dismissed, as in the event of this happening the supplies are at all times separated by a distance equal to the thickness of the original rubber.

Protection of Supplies

It may be safe to state that all buried pipes are subject to corrosion, and that the rate of deterioration is dependent upon the type and condition of the material surrounding the pipe, the materials most likely to be encountered in the normal way being (1) concrete, (2) plaster, (3) breeze, and (4) composition flooring.

In the case of new property, items (1) and (2) are unlikely to give cause for alarm as all supplies which are to be buried are given a protective coating at the time of installation in the form of bituminous paint when the supplies are to be covered by concrete, stone colour paint when the supplies are to be covered by plaster. The responsibility for painting supplies, and all other work entailed in their protection, normally rests with the builder, and reference should be made to this fact in the specification.

Items (3) and (4) may be dealt with together, as the method used is the same in each case—namely, a covering of at least ½ in. of sand and cement in the ratio of 2 : 1.

The work entailed in the protection of supplies is comparatively small, provided the composition of the material surrounding the pipe is known in advance. For instance, in the case of composition flooring, many are known to be of the magnesite type, necessitating further protection to the supplies, such as the provision of a lead sleeve at all points where the pipe rises out of the floor, the lead sleeve to extend at least 1 in. above floor level.

One method of avoiding the necessity of lead sleeves at all points would be the provision in the site-concrete of chases to extend to the extremity of the slab, so that the supplies when installed would rise in the brickwork, terminating where possible at a convenient point above floor level. The advantage of this method is that, in addition to an application of a protective coating to the supply, the chase itself is filled with the 2 : 1 mix of sand and cement prior to floor laying, the whole of the supply and its covering being below the composition flooring, which is usually not less than ¼ in. in thickness at any point.

Some floors are now known to be non-corrosive, but when sufficient information is not available, it is essential that a sample of the flooring be tested to ascertain whether or not it is of the magnesium oxychloride type.

Site Tests

Until recently, samples of flooring were forwarded to, and tests carried out by, Watson House, but it has now been made possible for a simple test to be carried out by the representative on the spot and takes only a few minutes. Very briefly, the test is carried out as follows:

A small quantity of the sample is filed off and placed in a test tube which is then half filled with distilled water and shaken. The solution is then filtered into a second test tube and a few drops of silver nitrate added to the filtered liquid. A copious white precipitate is found if magnesium oxychloride or other chlorides are present.

A final word on composition flooring. In the event of the necessity to cut into a specially finished floor, it is important to ascertain before cutting, the manner in which the floor was laid. For example, pitchmastic floors are laid in the molten state, and if chiselled when cold, cracks appear on the surface and spread to its extreme edge in a manner similar to cracked glass. The usual procedure is to remove the necessary portion of the floor with the aid of a blow lamp and replace in a similar manner if necessary.

BOOK REVIEW

AUTOMATIC CONTROL*

IN any work on the above subject one might perhaps reasonably expect to find some references to the automatic control of gas appliances. It will be found, however, that this work deals with the underlying principles which affect automatic control performance rather than with details of specific plant or equipment. It is, in fact, primarily intended for those concerned with any of the applications of automatic control and comprises a general survey of the wide field which such applications may involve, with an investigation of the basic nature of the problems which may be encountered.

It should be recognised at the outset that this is no textbook for beginners. The very first chapter launches straightway into highly technical considerations of control system behaviour, response to corrective action, and regulating unit characteristics; and subsequent chapters become increasingly technical and mathematical. Indeed, the author points out that the analysis by which the fundamentals can be reached is greatly facilitated by the employment of mathematical methods. This overcomes the difficulty which arises when endeavouring to visualise the simultaneous behaviour of the conditions involved. Accordingly, the author has used such methods where necessary—though he has introduced them in a manner which, it is hoped, will make them understood by readers not accustomed to their use. He warns the reader, however, that the application of fundamentals in any particular instance may present difficulty, and it will usually be necessary to adopt a simplified basis for the purpose of analysis. In such cases, care must be taken to have a clear understanding of the assumptions made. Any difference between the actual conditions and those expressed by the mathematical representation must always be fully appreciated.

In exploring the very wide field of possible application of automatic control, it has been necessary to omit much which could be included, and while the particular examples cited are not by any means comprehensive they do help to clarify the basic principles of an exceedingly complex subject. By applying the principles set out in this textbook, any particular application can be analysed and the most appropriate methods devised.

* 'Fundamentals of Automatic Control' by G. H. Farrington, B.Sc., A.C.G.I., Consultant Engineer, Ilford, Ltd. Chapman & Hall, Ltd., 37, Essex Street, W.C.2; 30s. net.

TRADE NEWS

Morgan Crucible Co.

A new booklet entitled 'Morganite Brushes' deals with the essentials for satisfactory brush operation on commutators. The various troubles to which commutators are subject are listed, together with their causes, while slip rings are dealt with in the same way. The services of the firm's technical advisory staff are available to users in cases of difficulty. (*The Morgan Crucible Co., Ltd., Battersea Church Road, London, S.W.11.*)

General Electric

An interesting brochure by the General Electric Co., Ltd., describes the magnetic sorting bridge—an apparatus for the rapid testing and comparison of ferromagnetic materials against known standards.

The magnetic sorting bridge consists of a simple electrical network in which the magnetic and (indirectly) the dimensional or metallurgical properties of two samples can be compared. Similar properties are made to cancel out and the differences are displayed on a cathode ray tube. This technique has the advantage that it is extremely sensitive, rapid and is non-destructive.

These characteristics indicate that the method is suitable for routine testing especially for the detection of deviations from normal in large numbers of small components, because a qualitative indication is given when a variation occurs in any one of several factors, so that rejected pieces can be re-examined by quantitive tests.

The desirability for 100% inspection of metal parts is common in aeronautics, automobile and other branches of engineering and it was realised by the G.E.C. that this was a promising field in which to investigate the possibility of using the magnetic properties of ferrous materials as a measure of their metallurgical and mechanical characteristics.

The work was carried out in conjunction with the Aero Engine Division of the Ford Motor Company with a view to obtaining a non-destructive method of testing ferrous samples for the variation in chemical composition, heat-treatment, hardness, depth of carburisation and the like. The outcome was an instrument which is now accepted as a metallurgical tool of considerable value and one which can often replace the use of chemical or spectrographic techniques, which take up a considerable amount of time, result in destruction of the samples and require the service of highly skilled personnel.

The basic principle of the instrument is quite simple and depends on the visual presentation of the phenomenon known as magnetic hysteresis. This is a property of ferromagnetic materials whereby when they are subjected to a varying magnetising force, the corresponding magnetic flux depends on whether the magnetising force is increasing or decreasing. (*General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.*)

R. & A. Main

Following the disaster of February, 1931, when areas of Hastings and Napier were devastated by earthquake, R. & A. Main, Ltd., donated a large number of gas appliances for allocation to houses which would have to be rebuilt, and for distribution by the Commissioner of Napier through the rehabilitation committee which was formed for that purpose.

Recollections of the event were revived recently when the company received the following letter from a Hawkes Bay, New Zealand, widow:

> 'Dear Sirs,—I was one of the fortunate women to be given one of your excellent gas stoves after the 1931 earthquake, which you presented for some of the victims of the 'quake, and have had all these years real service from it and it is still really good except that the griller has come to pieces and also the side shelve slides in the oven. I am writing to ask you if there is any chance of you sending me these parts. I should be most grateful. I cannot obtain them in New Zealand. I cannot send the money with this letter as I have no idea what it will cost, but if you could possibly oblige I will send money by return mail. I have sent a very rough sketch of the size of the griller.'

Further enquiry elucidated the fact that this correspondent had received a No. 76 'Mainservor' cooker, a most popular model at the time. Needless to say, the replacements parts have now gone forward with R. & A. Main's compliments. It is to be hoped that this 20-year-old cooker will now give further long years of service to its appreciative owner.

Chamberlain Industries

As an addition to their well-established range of products, Chamberlain Industries, Ltd., introduce their 'Staffa' ¾ in. single spindle screwing machine for high-speed threading of bolts, pipes, and many small components used in the engineering, building, aircraft, and automobile industries.

The pedestal of the machine is of fabricated construction, comprising two side panels, pressed-out from mild steel sheets, which form an integral part of the cutting lubricant and swarf cradle, obviating joins in the pedestal construction which would alloy cutting lubricants to escape. At the front and rear, removable panels allow complete access to the interior. The hollow spindle, upon which a rotating die head can be fitted, runs in self lubricating 'Oilite' bearings with thrust washers of the same material to accommodate end loads during cutting operation. Oil nipples are provided in the bearing housings for periodic oiling of the bearings.

The carriage assembly comprises a flat top table, to which any form of self-centering vice or work holding fixture may be mounted. To predetermine the length of thread to be cut, two screwed shafts with trip adjusting nuts are housed in tubular slide bars. The drive is through a single Vee belt running on an adjustable cone pulley. The variable drive assembly is mounted on a quadrant shape bearing operated by a control handle positioned at the side of the machine, and a pointer indicates on a graduated scale the speed at which the diehead is running.

The elimination of any outside foundation bolts or pipe fittings, which are all totally enclosed inside the pedestal, enables the operator to walk around the machine without the interruption of extraneous fittings. The machine can be supplied with or without diehead and self-centering vice, or according to client's requirements. (*Chamberlain Industries, Ltd., Staffa Works, Staffa Road, Leyton, E.10.*)

Purimachos, Ltd.

This striking display was arranged by Purimachos, Ltd., of St. Philip's, Bristol, manufacturers of refractory cements, at the Bristol Industries Exhibition.

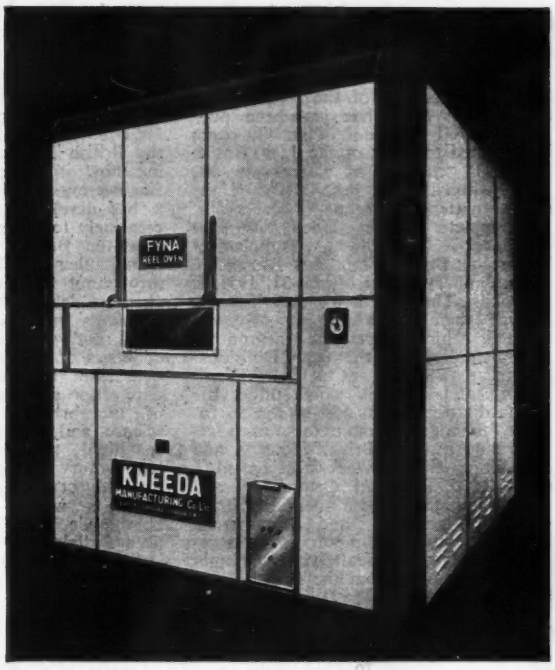
Kneeda Manufacturing Co.

We have received details of the 'Fyna' rotating reel oven which the manufacturers claim greatly simplifies the automatic baking of bread and confectionery. The oven is gas-fired and of steel-type construction with heavy gauge steel and asbestos sheets fastened to a rigid angle framework.

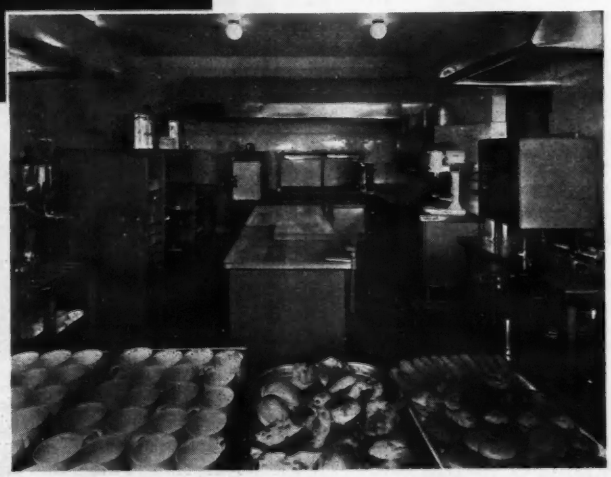
It is constructed in two boxes, one over the other, with an adequate quantity of first-class insulating material between. The oven carrier frames are strongly constructed and reinforced to ensure a constant level, and they are stabilised by the special simplified 'Kneeda' design which holds them level through all points of travel.

The oven can be thermostatically controlled, and a large dial thermometer is fitted for easy reading. The trays take approximately two minutes to complete the cycle round the oven, and their movement is controlled by a finely constructed mechanism which moves each tray, fully loaded, to the top, bottom, back and front, so that the goods get a radiant circulated heat which ensures evenness of baking. A glass panel fitted to the oven door gives a clear view of their travel round the interior of the oven.

The 'Fyna' rotating reel oven is compact and economical in fuel consumption, and no skilled labour is required to operate it. Two sizes are available, one with 12 carrier frames and the other with 16, each having a capacity of 288 and 384 2-lb. loaves respectively. Full details of this oven are available from the Kneeda Manufacturing Co., Ltd., 'Fyna' Works, 132-134, Lots Road, Chelsea, London, S.W.10.



KITCHENS by BENHAM



TWO examples are here illustrated of recent kitchen installations by Benham & Sons, Ltd.

In the main kitchen (above) and ground-floor servery of the Washington Hotel, N.W.3, are a 10-unit range comprising 9 units with ovens under and one deep fat fryer, bain marie, two 'Royal' roasting ovens, double deck pastry oven, stockpot stove, grillers and toasters, hot closets, &c. Benhams also supplied and fitted all floor serveries.

Our other photograph shows the gas cooking equipment comprising 2-unit 'Wigmore' range, griller and salamander, pressure steaming oven, tea and coffee set, hot closet and bain marie, &c., in the kitchen which serves the firm's staff restaurant. An outstanding feature of the well-equipped kitchen is the stainless steel ventilating hoods which incorporate concealed lighting. It caters for 140-160 persons a day.

British Standards

1951 YEAR BOOK

The new edition of the *British Standards Year Book* has just been published. Well over half of its 400 pages are devoted to a list of the 1,700 British Standards current at December 31, 1950, with a brief description of the subject-matter and scope of each one. A complete subject index simplifies reference. In addition, a supplement listing the British Standards issued between January 1 and March 31, 1951, is included. The year book also lists the current membership of the General Council, which guides the Institution's general policy; of the four Divisional Councils (Building, Chemical, Engineering and Textile), which direct the standardisation work; and of the 56 Industry Standards Committees, each representing a major British industry, and through which that work is delegated to some 2,000 Technical Committees and Sub-committees, whose members bring specialist technical and commercial knowledge to bear upon every standardisation project dealt with. Copies may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1., price 7s. 6d. each, post free.

JUBILEE

A specially-written history under the title of *Fifty Years of British Standards, 1901-1951,* is an illuminating record of the British Standards movement—showing how it originated in 1901 as the Engineering Standards Committee, how it has developed and contributed increasingly to the national economy, and how the British model, in this as in many other fields, has been followed throughout the civilised world. Special chapters deal with the influence of the standards movement in the two world wars, and with its spread to all the countries of the British Commonwealth; with the relationship between standardisation and research, and with some of the brilliant figures in industry, science and the arts who have helped to build the movement during its half-century of steady growth. Though the subject is highly specialised, the book is written in an easy, readable style, and it throws a long-needed light upon a facet of British industrial genius about which too many people know far too little. Copies can be obtained from the British Standards Institution, Sales Department, 10s. 6d. each, post free.

COMPANY NEWS

DE LA RUE

Because of the difficulty experienced in interpreting the 1949-50 preliminary statement, Thomas De La Rue & Co., Ltd., has—with the concurrence of the Stock Exchange—confined the disclosure of results of the year ended March 31 last to the full report. This shows that consolidated trading profits and other income have recovered by £108,000 to £794,000. The 50% dividend is being repeated, from group earnings this time in the region of 71%, a calculation unembarrassed by tax complexities—although the past year's charge, accounting for some 70% of gross profit, is disproportionately high. It suggests that the company has adopted a conservative basis of assessment like that which operating in the past has given rise to tax credits of £222,000 in this year's accounts.

Though the bank overdraft at March 31 last was only £45,000 down at £520,000, the company has since retired the £204,000 4½% first mortgage debenture stock without, it is understood, any further recourse to borrowing. At 35s. the ordinary stock 5s. units return about 7¼%.

Consultative Council Appointments

Eastern

Mr. C. H. Frewer (Norwich) has been appointed a member of the Eastern Gas Consultative Council.

North Eastern

Councillor W. Holdsworth (Dewsbury), Councillor C. Smart (Leeds), Councillor W. Hipwell (Market Weighton), Councillor Mrs. M. Knowles (Bentham) and the Rev. J. C. Dupuis (Thirsk) have been appointed members of the North Eastern Gas Consultative Council.

Southern

Mr. J. N. Cantelo (Southampton) has been appointed a member of the Southern Gas Consultative Council. He takes the place of Mr. R. Bates (Purbrook), who resigned in May on account of ill-health.

South Western

Councillor L. N. Deeley, B.SC. (Crewkerne), has been appointed a member of the South Western Gas Consultative Council.

East Midlands

Alderman J. B. Griffin (Nottingham) and Councillor H. Cant (Grantham) have been appointed members of the East Midlands Gas Consultative Council.

Wales

Mr. David Jones, personal assistant to Alderman G. F. Hamer, Chairman, has been appointed Secretary to the Wales Gas Consultative Council. At a meeting of the Council on July 20 Mr. T. O. Jones (Neath) was thanked for his services as Acting Secretary.

CO-OPERATION WITH PLUMBERS

THE Edinburgh Division of the Scottish Gas Board, in pursuance of its policy of furthering contact with the plumbing trade, recently organised a meeting at the Music Hall, George Street, to which members of the Edinburgh and District Master Plumbers' Association were invited to introduce to them the new range of Ascot appliances.

Mr. Smith then called upon Mr. G. E. Jeffs (Northern Manager of Ascot Gas Water Heaters, Ltd.) to outline the various technical advantages which had been incorporated in the new range of appliances. This talk by Mr. Jeffs was followed by an interesting and lively discussion in which many of the members took part.

Members of the Edinburgh and District Master Plumbers' Association assembled to learn of new features in Ascot gas water heaters.

The meeting was attended by 52 members, and the policy of the Division was briefly outlined by Mr. Thomas Smith (Sales Superintendent), who promised a continuance of the Edinburgh undertaking's former co-operation with the plumbing trade.

At the conclusion of the meeting, Mr. Daniel Barron (President of the Association) thanked the Scottish Gas Board for their hospitality and stated that the assistance received from Mr. Smith and his staff in the past was very much appreciated by their members.

MT9 *Photo: By courtesy of the Director of Housing, Corporation of Glasgow.*

Solid Drawn copper tubes for electrical conduit, domestic water, and gas services. Specify for electrical conduit—BS 840/39; for water and gas services—BS 659/1944; for underground water services—BS 1386/1947.

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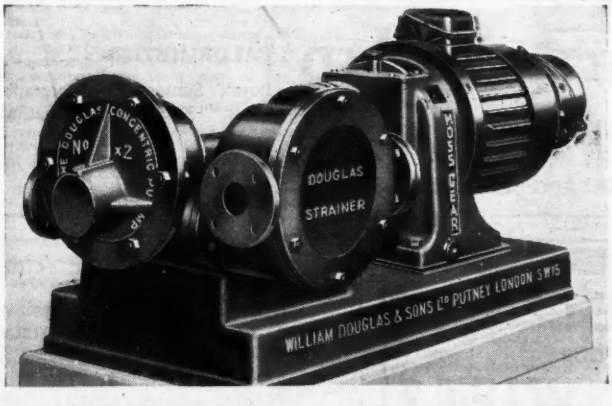

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INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C

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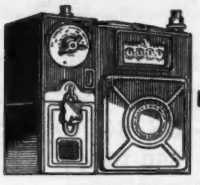
AN ENTERPRISING MEASURE No. 7

Columbus sailed out to the West
to unknown destinations.
His enterprise we must extol
with certain reservations.
We can't accept without a sigh
Jazz—Glamour Girls—the Crooning Guy.

Of all the outstanding events of the 15th Century none is more important than the discovery of America by Columbus in 1492. A new world was displayed and a new career opened up to adventurous men and nations. Enterprise and initiative are largely responsible for the continued success and wide sale of our modern measure—the 'A. & M.' Gas Meter.



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"Mitchell" SLAT CONVEYOR—80 ft. long × 30 in. wide.
"Paxman" LOCO TYPE BOILER, 7,000 lbs. evap., 100 w.p.
R.S. Cyl. ENC. TANKS—34 ft. × 5ft 6in., 26ft. × 7 ft., 30 ft. × 7 ft. 6in., and 25 ft. × 5 ft. 6 in.
"B. & W." COMPRESSOR, 3 cyl., 400 c.f. p.m., 100 lbs. w.p.
HARRY H. GARDAM & CO. LTD.

PLANT FOR SALE *(ctd.)*

O. E. T. CRANES
FOR IMMEDIATE DELIVERY

FOR SALE: Two-ton Capacity O.E.T. CRANES by "Morris." Span 31ft. 6in. Motorised all motions for 400/3/50 supply. Fitted magnetic brakes. Cab or floor control. Span could be altered to customers specification.

COX & DANKS LTD.,
Frederick Rd., Salford, 6.
Wadsley Bridge, Sheffield, 6.
Scapa House, Park Royal Rd., N.W.10.
Oldbury, Langley Green, Birmingham.

"KLEENOFF"

THE COOKER CLEANER

Tins for Sale to Consumers. In Bulk for Works Use

OXIDE OF IRON

BALE & CHURCH, LTD.

7, CROMPTON WAY, MANOR ROYAL, CRAWLEY, SUSSEX.

Telephone CRAWLEY 1212-3. Telegrams: "Balefire, Crawley."

PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/-; by post 1/2d.

Subscription Rates: Home and Empire :- 52/- per annum; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone: Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. Telegrams: Gasking, Fleet, London.

APPOINTMENTS VACANT

ROBERT DEMPSTER & SONS LTD., Elland, Yorks, have a vacancy for a SENIOR DRAUGHTSMAN for proposal and contract work, preferably with experience in Gasholders and Purification Plant. Permanent and progressive post. Pension Scheme.

WEST MIDLANDS GAS BOARD

BIRMINGHAM DISTRICT.
CHIEF DRAUGHTSMAN AND
ASSISTANT CONSTRUCTIONAL ENGINEER.

APPLICATIONS are invited for the above position on the Divisional Engineer's Staff at Saltley Gas Works.

Candidates must have had good drawing office training and experience, including the layout of all types of gas works plant, the preparation of specifications and estimates and general handling of contracts.

Candidates must also be capable of site supervision during erection of plant and have some experience of building contracts including reinforced concrete work.

Experience with gas works contractors will be an advantage.

The salary will be within the salary range £800-£950.

The successful candidate may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may, in due course, adopt.

Applications, stating age, qualifications and details of training and experience, together with the names of two referees, should be addressed to the Personnel and Establishment Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 16, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION.
ACCOUNTANCY ASSISTANT—
WOLVERHAMPTON DISTRICT.

APPLICATIONS are invited for the above position at the District Office, Wolverhampton.

The salary for the position will be not less than £570 per annum rising by annual increments to a maximum of £670 per annum, in accordance with Grade IX of the salary scales of the National Joint Council for Gas Staffs.

The duties of the post will include the routine supervision of the accountancy and costing systems and the preparation of financial and costing statements under the general supervision of the District Accountant.

Experience in the Gas Industry and the possession of a professional qualification will be advantageous.

The appointment will be subject to such regulations as the Board may, in due course, adopt, and any existing superannuation rights in the gas industry would be preserved. The successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and experience, giving the names of two referees, should be addressed to Mr. F. C. Briggs, Divisional Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, Worcs., to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION.
LEAMINGTON DISTRICT.
TECHNICAL ASSISTANT.

APPLICATIONS are invited from suitably qualified persons for the above position.

Candidates should hold the Higher Grade Certificate of the Institution of Gas Engineers (Gas Engineering—Manufacture) and have practical experience in the Chemical control of Works Plant. Preference will be given to candidates having experience of Glover-West Continuous Vertical Retorts and C.W.G. Plant.

The salary for the post will be not less than £500 per annum on commencement, rising by annual increments to a maximum of £580 per annum, in accordance with Grade VII of the salary scales of the National Joint Council for Gas Staffs.

A house is available at a reasonable rent, if required.

The appointment will be subject to such Superannuation Regulations as the Board may in due course adopt and the successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and details of training and experience, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION.
DUDLEY DISTRICT—
WORKS SUPERINTENDENT.

APPLICATIONS are invited for the position of SUPERINTENDENT of the Dudley Gas Works. The plant consists of Glover West and Woodall-Duckham Vertical Retorts and large Automatic C.W.G. plant.

The Works Superintendent will be responsible to the Engineer and Manager for the control of all technical staff and work people engaged on the Works, and for the operation and maintenance of works plant and vehicles. Good organising ability and experience in a similar position are essential. Possession of appropriate examination certificates would be considered advantageous.

The salary for the post will be not less than £620 per annum on commencement, rising by annual increments to a maximum of £720 per annum, in accordance with Grade X of the salary scales of the National Joint Council for Gas Staffs.

The appointment will be subject to the provisions of such superannuation scheme as the Board may in due course adopt, but existing superannuation rights in the Gas Industry will be safeguarded. The successful candidate may be required to pass a medical examination.

A flat could be made available for the successful applicant, in due course, in premises situated on one of the undertaking's works.

Applications giving details of age, qualifications, and experience, together with the names of at least two referees, should be addressed to Mr. F. C. Briggs, Divisional Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, Worcs., to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION.
ACCOUNTANCY ASSISTANT—
DIVISIONAL OFFICE.

APPLICATIONS are invited for the above position at the Divisional Office, Dudley.

The salary for the position will be not less than £570 per annum, rising by annual increments to a maximum of £670 per annum, in accordance with Grade IX of the salary scales of the National Joint Council for Gas Staffs.

The duties of the post will include routine supervision of the costing system, the preparation of cost statements and the organisation of the work of expenditure analysis by punched card methods, under the general direction of the Divisional Accountant.

Experience in punched card methods and the possession of a professional qualification will be advantageous.

The appointment will be subject to such superannuation regulations as the Board may, in due course, adopt, and any existing superannuation rights in the gas industry would be preserved. The successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and experience, giving the names of two referees should be addressed to Mr. F. C. Briggs, Divisional Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, Worcs., to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

A WELL KNOWN MANUFACTURER of gas appliances has a vacancy in its Research Department for a Graduate in either Physics or Mechanical Engineering. The successful applicant will be required to act as deputy to the Head of the Department. Previous experience in gas appliance design and manufacture is desirable, as is the ability to control staff. Applications stating age, salary required, qualifications and experience together with *copies* of two recent Testimonials should be forwarded within seven days of the publication of this advertisement. No. 9970, *Gas Journal*, 11 Bolt Court, Fleet Street, London, E.C.4.

NORTHERN GAS BOARD

DARLINGTON DIVISION.
CENTRAL SUB-DIVISION.
SHIFT ENGINEER.

APPLICATIONS are invited for the position of SHIFT ENGINEER at the Darlington Unit of the Northern Gas Board.

Salary in accordance with the National Joint Council for Gas Staffs Agreement, Grade A.P.T. V, Provincial 'A' Scale—£425 to £505 per annum. Initial placing in accordance with experience.

Applicants must have a sound practical experience in the control and operation of Vertical Retorts, Carburetted Water Gas Plant and Ancillary Gasworks Plant.

Applications, stating age, particulars of training, experience and qualifications, should be submitted to Charles Hindle, Esq., Engineer & Manager, Darlington Unit, Gas Offices, John Street, Darlington, not later than September 3, 1951.

F. WILSON,
Divisional General Manager.

August 13, 1951.

(*Classified advertisements continued on Supplement 4*)

APPOINTMENTS VACANT (ctd.)

NORTHERN GAS BOARD

HEXHAM DIVISION.
TECHNICAL ASSISTANT.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT to the above Division.

Applicants should hold an Institution of Gas Engineers' Certificate in Gas Engineering (Manufacture) and have experience and practical knowledge of general Works operation, control of Continuous Vertical Retorts and laboratory practice.

The Salary will be in accordance with Grade VII, Provincial 'B'—£485 to £565 per annum. The successful applicant may be required to pass a medical examination, and to subscribe to such scheme of superannuation as the Board may adopt.

If required a Flat will be available in the near future at a reasonable rental.

Applicants should furnish details of training, qualifications and experience, together with the names and addressses of two referees, to reach the undersigned not later than September 3, 1951.

H. D. LEES,
Divisional General Manager.

NORTHERN GAS BOARD

CARLISLE DIVISION.
SENIOR TECHNICAL ASSISTANT.

APPLICATIONS are invited for the position of SENIOR TECHNICAL ASSISTANT to the Carlisle Division of the Northern Gas Board.

Applicants should be experienced in the control o all Gas Works plant including Vertical Retorts.

The appointment will be subject to the Conditions of Service set out in the Agreement of the National Joint Council for Gas Staffs, and the salary will be within Grade A.P.T. IX.

The successful applicant will be required to undergo a medical examination, and the appointment will be subject to such superannuation scheme as the Board may adopt in the future.

Applications, stating age, qualifications, present position and previous training and experience, together with the names of two referees, should be sent to the undersigned not later than September 7, 1951.

J. G. AITKEN,
Divisional General Manager.

Gas Works,
Rome Street,
Carlisle.

DRAUGHTSMEN required experienced in Gasworks and By-Products Plants. Good pay for experienced men, capable of Design and Development work. Pension Scheme and Canteen facilities.

Apply, stating experience and qualifications to W. C. Holmes & Co. Ltd., Whitestone Ironworks, Huddersfield.

WALES GAS BOARD

APPLICATIONS are invited for the following positions :—

CHIEF DRAUGHTSMAN, at the Technical Headquarters of the Board.

The successful candidate will be responsible for the organisation and supervision of the Technical Headquarters Drawing Offices and must be qualified by training and experience to carry out this duty. He must also be qualified to prepare drawings, specifications and estimates in connection with civil, mechanical and constructional engineering work.

The commencing salary will be within the range of £800/£900 per annum dependent upon qualifications and experience.

CARBONISING ASSISTANT to the Gas Engineer of the Board.

The successful candidate will be required to give technical assistance and supervision at gasworks throughout the Board's area in connection with the construction, repair, maintenance and operation of gasmaking plant with a view to increasing plant output, gas making efficiency, working life of retort settings and general working economy.

Applicants should possess the Higher Grade Certificate in Gas Engineering—Manufacture—of the Institution of Gas Engineers or its equivalent and have had experience in the erection, maintenance and control of all types of gasmaking plant.

Experience with horizontal retorts in large and small units will be a necessary qualification.

The salary will be within Grade A.P.T. VIII of the Salary Scales of the National Joint Council for Gas Staffs (£540-£620 per annum) in accordance with qualifications.

The above appointments will be subject to the provisions of such a Superannuation Scheme as the Board may, in due course, adopt and the successful candidates will be required to pass a medical examination.

Applications giving details of age, qualifications and experience, together with the names of two referees should be sent to the Secretary, Wales Gas Board, 1/2, Windsor Place, Cardiff to reach him not later than September 17, next.

C. B. MAWER,
Secretary.

APPLICATIONS are invited for a position with a leading Scottish firm of manufacturers of Domestic and Heavy Duty Cooking Equipment. The position is for a CHEMIST to take charge of development and testing of equipment on the laboratory side, with particular reference to appliances using Town's Gas. Applicants should have qualifications in chemistry, preferably physical chemistry. Experience of this type of work would be an advantage. Address : 1686, Wm. Porteous & Co., Glasgow.

THE UNIVERSITY OF LEEDS

DEPARTMENT OF COAL GAS AND FUEL INDUSTRIES.

APPLICATIONS are invited for the position of LECTURER in Gas Chemistry at a salary on the scale £550-£50-£1,100 a year, according to qualifications and experience. The duties of the Lecturer will be primarily concerned with the properties of gaseous fuels, with special reference to the manufacture and purification of coal gas. Candidates should be qualified in physical or organic chemistry, or in applied chemistry, and experience in the gas or fuel industries is desirable. Applications (three copies), together with the names of three referees, should reach the Registrar, The University, Leeds 2 (from whom further particulars may be obtained) not later than September 26, 1951.

EAST MIDLANDS GAS BOARD

NOTTS. AND DERBY DIVISION.
DERBY UNDERTAKING.
ASSISTANT MAINS SUPERINTENDENT.

APPLICATIONS are invited from suitably qualified persons for the appointment of ASSISTANT MAINS SUPERINTENDENT at the above Undertaking.

Applicants must be experienced in High and Low Pressure Gas Distribution and Mainlaying and possession of the Institution of Gas Engineers' Certificates in Gas Supply would be an advantage. Salary Grade A.P.T. VII, Provincial 'A,' Scale £500/580 commencing at a figure commensurate with qualifications and experience.

The post is superannuable, and the successful candidate may be required to undertake a medical examination.

Applications stating age and experience, giving full particulars of training, qualifications, together with the names of two referees, should be addressed to the undersigned for receipt within fourteen days of the appearance of this notice.

K. L. PEARCE,
Divisional General Manager.

Friar Gate,
Derby.
August 16, 1951.

EAST MIDLANDS GAS BOARD

NOTTS. AND DERBY DIVISION.
DERBY UNDERTAKING.
ASSISTANT INDUSTRIAL GAS ENGINEER.

APPLICATIONS are invited from suitably qualified persons holding Certificates in Gas Engineering (Supply) for the appointment of ASSISTANT INDUSTRIAL GAS ENGINEER for the Derby Undertaking. The salary offered for the post is in accordance with A.P.T. Grade VII, Provincial 'A,' Scale £500/580 commencing at a figure commensurate with qualifications and experience.

Candidates must have a sound knowledge of combustion and utilisation of gas for industrial and commercial purposes, particularly as applied to heavy industry.

The post is superannuable and the successful candidate may be required to undertake a medical examination.

Applications stating age and experience, giving full particulars of training, qualifications, together with the names of two referees, should be addressed to the undersigned for receipt within fourteen days of the appearance of this notice.

K. L. PEARCE,
Divisional General Manager.

Friar Gate,
Derby.
August 16, 1951.

NORTH EASTERN GAS BOARD

YORK HARROGATE GROUP.
SHIFT ENGINEER—YORK WORKS.

APPLICATIONS are invited for the position of Shift Engineer at the York Works of the above Group, at a salary in accordance with Salary Scale A.P.T. Grade VII, £500-£580 per annum.

Applicants should hold the Higher Grade Certificate in Gas Engineering (Manufacture) of the Institution of Gas Engineers, and have experience in the control of works plant, in particular Continuous Vertical Retorts, Horizontal Retorts, and C.W.G. Plants.

Housing accommodation (at a rental) is available if required.

The appointment will be subject to such superannuation scheme as the Board may adopt and the successful applicant passing a medical examination.

Applications stating age, experience, training and qualifications should be submitted to the Group General Manager, N.E. Gas Board, York-Harrogate Group, 48, James Street, Harrogate, to reach him within ten days of the publication of this advertisement.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
August 16, 1951.

NORTH WESTERN GAS BOARD

SOUTH LANCASHIRE GROUP.
CARBONISING SUPERINTENDENT—
WIDNES WORKS.

APPLICATIONS are invited for the above position.

The successful applicant will be responsible to the Station Engineer for the supervision and technical control of a Drakes Horizontal Retort Plant, together with ancillary plant (capacity 3 million cu. ft. per day).

Applicants should possess the Higher Grade Certificate (Gas Engineering—Manufacture) of the Institution of Gas Engineers, or its equivalent.

The commencing salary will be within Grade A.P.T. VI of the National Salary Scales (£455-£535 per annum) according to experience and qualifications.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, suitably endorsed, giving personal details, particulars of training, qualifications and experience, together with the names and addresses of two referees, should reach the General Manager, North Western Gas Board (South Lancashire Group), Radiant House, St. Helens, not later than twelve days after the publication of this advertisement.

NORTH WESTERN GAS BOARD

KENDAL GROUP.
DISTRICT DISTRIBUTING ENGINEER—
KENDAL DISTRICT.

APPLICATIONS are invited for the above position.

The successful applicant will be responsible to the Group Distributing Engineer for all aspects of the distributing of gas, including the control of mainlaying staff and the supervision of mainlaying work carried out by Contractors within the District, together with the preparation of schemes for extension or modification of the existing mains network.

Applicants should have had practical experience and should possess the Higher Grade Certificate (Gas Engineering—Supply) of the Institution of Gas Engineers.

The salary will be within the range of Grade A.P.T. VII of the National Salary Scales (£500-£580 per annum) according to experience and qualifications.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, endorsed "District Distributing Engineer," stating age, education, qualifications and experience, together with the names and addresses of two referees should reach the General Manager, North Western Gas Board (Kendal Group), Gas Works, Kendal, not later than twelve days after the publication of this advertisement.

CONTRACTS OPEN

WALES GAS BOARD

TREDEGAR GROUP.

TENDERS are invited for the supply, delivery and erection at Ebbw Vale of a 500,000 cu. ft. Gasholder.

Specification, Conditions of Contract, etc., maybe obtained from the undersigned.

Tenders enclosed in plain, sealed envelopes, endorsed "Gasholder" and addressed to the undersigned to be received not later than Wednesday, September 26, 1951.

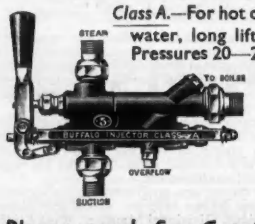
The Board does not bind itself to accept the lowest or any Tender.

S. L. FILER, M.Inst.Gas.E,
M.Inst.F.,
Chairman & Convener,
Tredegar Group.

Gas Offices,
Poplar Road,
Tredegar,
Mon.

BUFFALO INJECTOR

Class A.—For hot or cold water, long lifts, etc. Pressures 20—200lbs.



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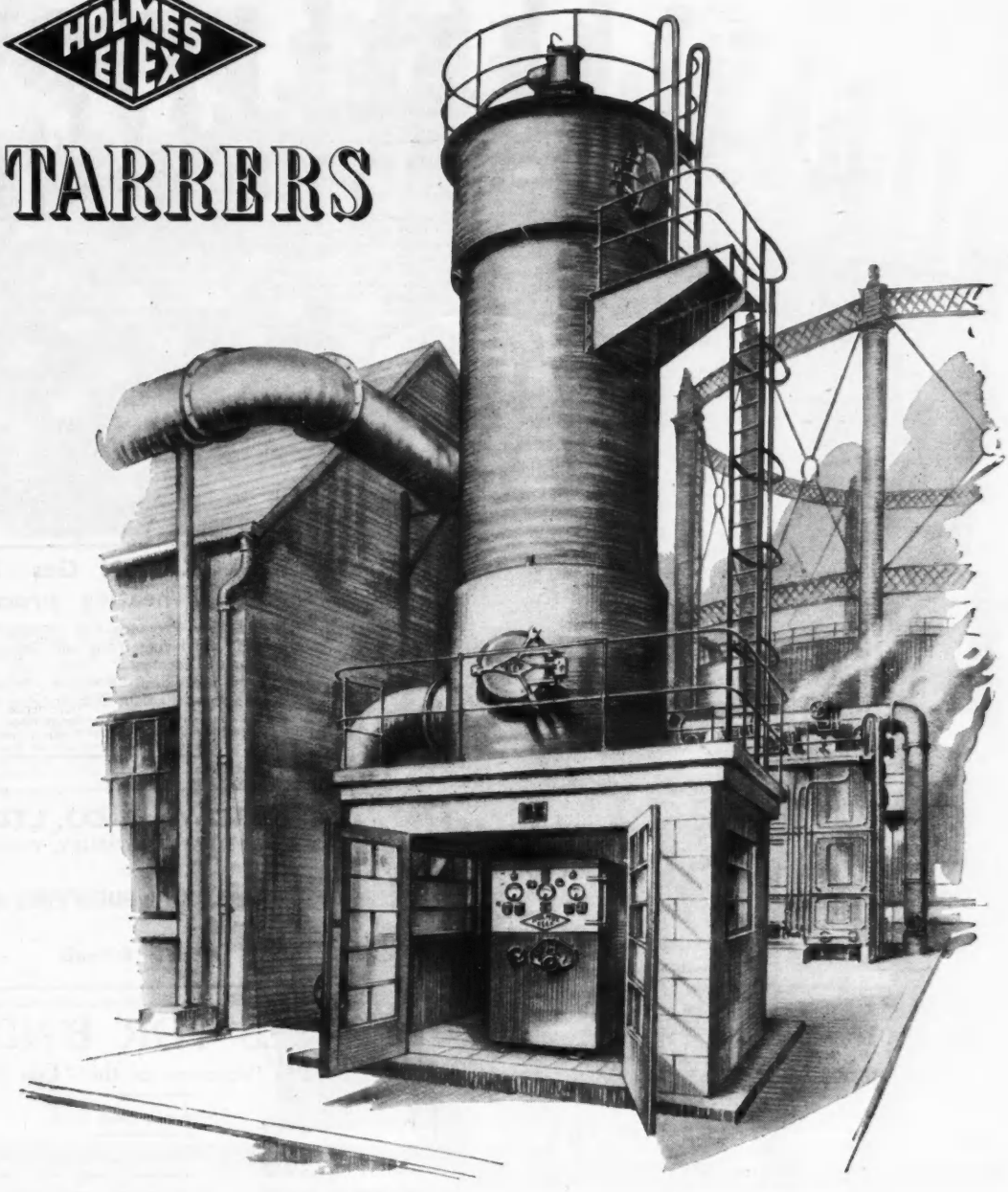
GREEN & BOULDING, LTD.
162a Dalston Lane, London, E.8

HOLMES ELEX

DETARRERS



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There is KEITH BLACKMAN Gas Equipment for almost every industrial heating process . .

KEITH BLACKMAN LTD. MILL MEAD ROAD, LONDON, N.17.

including High and Low Pressure Gas Injectors, Burners and Nozzles; Blowpipes; Soldering Irons and Stoves; Air and Gas Mixture Controllers; Thermostat Controllers; Back-pressure, Meter Protection and Safety Shut-off Valves; Pressure Governors, Air and Gas Compressors; Radiant Disc Burners, etc.

The illustration shows a concentric ring burner for a 500-gal. varnish boiling pot. Made in 5 sections with 148 stainless steel burner heads, it consumes 1200 c. ft. p.h. from "K.B." Mixture Controllers and Air Blower.

JOINTS, GASKETS, WASHERS,
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CENTRAL MANFG., & TRADING CO. (DUDLEY) LTD.
OLD HILL **STAFFS.**
PHONE: CRADLEY HEATH 69181 (5 LINES).
"EVERYTHING IN ASBESTOS."

J. BROWN & CO. LTD.
SAVILE TOWN, DEWSBURY, YORKS.
Supply:–
"BROWNOX-de-LUXE" PURIFYING MATERIAL
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SPENT OXIDE

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

CASES FOR BINDING
Quarterly Volumes of the "Gas Journal."
5/- each, post free
Walter King, Ltd., 11, Bolt Court, Fleet Street, London, E.C.4.

EB Service in
WELDING
SPRAYING
GUNNING
of
GAS RETORTS
Write for particulars of how E.B. experience can help in reducing maintenance costs in refractory constructions.
Manufacturers of all types of Cements.
E. B. REFRACTORY CEMENT CO. LTD.
OAKFIELD OFFICES, BRETTELL LANE, STOURBRIDGE

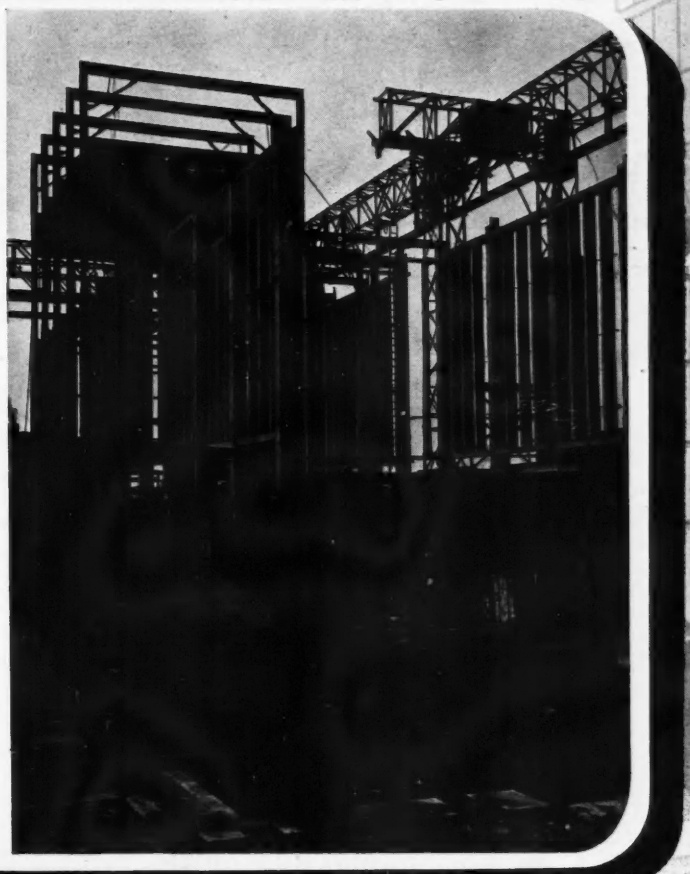
RETORTS MADE GAS TIGHT
when patched with–
ONX SUPER 83 BRAND FIRE CEMENT

A recent testimonial from Gas Dept.
"We are pleased with results obtained after using ONX Super '83' Brand. "Our settings were very bad, with large cracks in retorts, and portions of wall actually collapsed.
"Now, six months after repairing 28 retorts they appear as sound as ever; we anticipate the life of the settings will be prolonged."

A. L. CURTIS & CO., Westmoor Works, **CHATTERIS**, Cambs., Eng.

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4. Wednesday, August 22, 1951.

Work in progress



COVENTRY,

Foleshill Works

Benches G.H. & J. under construction, each comprising 24, 50 inch Glover-West Vertical Retorts.

West's Gas

IMPROVEMENT CO., LTD.

MILES PLATTING, MANCHESTER, 10

Telephone: COLlyhurst 2961–5. Telegrams: Stoker, Manchester.

London Office: COLUMBIA HOUSE, ALDWYCH, W.C.2. Telephone: HOLborn 4108–9. Telegrams: Wesgasco, Estrand.

". . . we have each of us a trade and are in our proper position when exercising it . . ."

Wellington's reply to Canning in 1827 when asked to become Prime Minister.

WELLINGTON TUBE WORKS LTD

FOR STEEL TUBES AND STEEL TUBE FABRICATION

HEAD OFFICE & WORKS · GREAT BRIDGE · TIPTON · STAFFS